MACHINERY ISSUE

THE IRON TRADE REVIEW

Published Weekly
Vol. LXIII No. 1

CLEVELAND, JULY 4, 1918

Entered as second class matter at the postoffice at Cleveland, Ohio, under the act of March 3, 1879

Four Dollars a Year
Single Copies 15 Cents

The

THREE LIBERTY LOANS
TO MANKIND

FIRTH-STERLING STEEL COMPANY

Blue Diamond Chip High Speed

and other

FIRTH-STERLING TOOL STEELS

McKeesport, Pa.

NEW YORK BOSTON PHILADELPHIA
CLEVELAND PITTSBURGH
CHICAGO

Advertisers' Index, pages 225-227. Contents, page 2 (Editorial) "Where-to-Buy", page 138.
Engineering Directory, pages 192-193 Classified Advertisements, pages 202-224

PREPAREDNESS

(1) Since the Koppers Company was acquired by American owners, January 1, 1915, it has placed in operation 16 by-product coke plants, totaling 1810 ovens and 30 benzol plants. Between now and September 1, 1918, it will put into operation seven (7) additional coke plants totaling 1490 ovens and ten (10) additional benzol plants, making a total of 3300 ovens and 40 benzol plants placed in operation in three years and eight months—an average of one benzol plant per month and one coke plant every two months since the first one was placed in operation.

(2) The total annual production of coke and by-products from these plants will be:

Coke	15,700,000 net tons
Tar	160,000,000 gallons
Sulphate of Ammonia	266,000 net tons
Benzol	54,000,000 gallons
Toluol	17,700,000 gallons
Surplus Gas	109 billion cubic feet

with a total annual value at present prices of approximately $187,000,000.

(3) Of this amount, the annual savings through the use of Koppers plants as compared with beehive ovens, totals $90,000,000. The performance of these plants that are now in operation is such as to demonstrate beyond dispute that Koppers' present practice leads the world in the manufacture of coke and its by-products.

(4) The Company is stronger today and is better prepared than ever before to execute rapidly a large volume of work.

H. KOPPERS COMPANY

PITTSBURGH, PA.

THE IRON TRADE REVIEW

Vol. LXIII Cleveland, July 4, 1918 *No. 1*

War Production Raises Problems

Realignment of Operations to Serve Special Needs Causes Complications—May Equalize Sheet Bar Supply—Rail Mills to Resume Normal Rolling on Government Orders—Disparity of Iron Costs Undergoing Study

PRODUCTION and distribution problems are absorbing the chief attention of government officials and iron and steel makers. Intense war demands in certain products have so unbalanced the normal alignment of operations under commercial conditions that various complications are resulting. Steel sheet makers at the government's request are endeavoring to equalize the supply of sheet bars among various mills in order to sustain a 75 per cent finished output. At present independent plants are operating about 85 per cent and those of the Steel corporation at about 45 per cent. Rail mills now rolling projectile rounds are about to resume normal operations to supply 1,500,000 to 2,000,000 tons of rails for the various government-controlled roads. Distribution of these orders is due to follow the announcement of standard rail prices at $55, mill, for bessemer, and $57, mill, for open hearth expected to be made this week. Large additional government orders for railroad equipment wait upon further progress in supplying the steel needs of the shipbuilding program. Raw steel is being drawn from wire mills to supply producers of material for which the essential demand is more pressing.

Await Ruling on Jobbers

The position of the jobbers continues the subject of considerable confusion. Most mills are reluctant to ship tonnage to replace stocks which have been distributed for essential purposes until the government more definitely announces the procedure to be followed. Quick action is being urged on Washington, as considerable tonnage is tied up. In merchant wire products the situation has been clarified by a ruling classifying this material under food requirements. This allows a freedom of shipment to jobbers without priorities certificates.

The priorities committee of the war industries board has further emphasized the responsibility of iron and steel producers to ship for essential purposes without requiring priorities certificate. The flood of applications for certificates and the confusion resulting from varied interpretations of the priority system have made further explantions necessary. Only about 50 per cent of present steel deliveries are covered by priority. Not all the direct government business, it is pointed out, calls for priority.

May Equalize Iron Costs

Nothing tangible yet has developed from the movement to equalize the disparity in costs between geographical groups of pig iron producers. This proposal has been brought to a head by the variable additions to raw material charges resulting from the percentage increase in freight rates. It is aimed particularly to provide relief for furnaces of Tennessee, Virginia and in the east. No single plan received common endorsement at the general meeting of furnacemen in Pittsburgh last week and the matter has been put in the hands of the committee on pig iron, iron ore and lake transportation for full inquiry. Any modification tending to complicate the present price schedule is being discouraged. The selection of Birmingham and Pittsburgh as basing points is receiving careful consideration. If such a plan prevails it would in effect create a modified zone system.

Profitable furnace prices have added importance in view of the rapidly growing volume of government allocations of pig iron. In the past two months these have totaled about 165,000 tons of all grades. A further heavy tonnage is in process of distribution including large lots of low phosphorus for eastern consumers.

Iron Output Maintained

Pig iron production is being well maintained. June's output of 3,335,182 tons excepting May was the highest since July, 1917. Its daily average was only 178 tons less than in May, which made the best showing in this regard since October, 1916. Furnaces in blast in June were 355 against 360 in May.

JULY 4, 1918

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metalworking Industries.

Published Every Thursday by
THE PENTON PUBLISHING CO., Cleveland

BRANCH OFFICES

CHICAGO - - - - - 1147 Peoples Gas Bldg.
CINCINNATI - - - - - - 128 Opera Place
NEW YORK - - - - - - 508 West St. Bldg.
PHILADELPHIA - - - - 1316 Land Title Bldg.
PITTSBURGH - - - - - 2148-49 Oliver Bldg.
WASHINGTON, D. C. - - - 40 Metzerott Bldg.
BIRMINGHAM, ENG. - - - Prince's Chambers

Subscription, United States and Mexico, $4 per year. Canada, $6, and other Foreign Countries, $8 per year.

Entered at the Postoffice at Cleveland as Second Class Matter

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IN THIS ISSUE

PAGE

IRON AND STEEL MARKET REVIEW..... 1
EDITORIALS 2, 3
IRON AND STEEL PRICES.....4, 64
INDEX TO MARKET REPORTS..... 4
IRON AND STEEL MARKETS..... 5
INCREASES BLAST FURNACE CAPACITY..... 17
Lackawanna Steel Co. Now Has Its Eighth Stack in Operation—Adhere to Flare-Type Hearth Jacket.
HOW TO STORE YOUR COALS..... 21
DESIGNS HIGH-CUTTING SPEED PLANER..... 22
Machine Built as a Result of Experiments Conducted to Develop a Planing Tool That Would Operate at Fast-Cutting Speeds.
DESIGNS HEAVY-DUTY ROLLING MILL LATHE..... 24
FILLING THE GAPS IN SHOP EQUIPMENT..... 25
Unprecedented Conditions Induced by Top Speed War Production Have Created a Wide Field of Usefulness for the Dealer in Used Machine Tools.
HOW CAST STEEL CHAINS ARE MADE..... 29
Continuous and Pre-cast Link Processes Are Described Before American Society for Testing Materials.
CONCESSIONS MADE IN STEEL STANDARDS..... 33
INAUGURATE NEW WAR ORGANIZATIONS..... 48

Higher Sulphur and Phosphorus Steels

WHILE steel manufacturers may seem to have scored heavily on consumers in having the rejection limits for sulphur in all steels and phosphorus in acid steels raised 0.01 per cent, in 40 specifications of the American Society for Testing Materials, in reality it is a great victory for all users of steel products. Confronted with a constantly diminishing supply of steel for general purposes and daily expanding requirements for war needs, consumers placed an almost insurmountable barrier before themselves by insisting upon a strict compliance with the chemical limits of the Testing Society's standards on the small tonnage of steel now available. This increase in the maximum sulphur and phosphorus will greatly facilitate manufacture and will release a large amount of rejected material that did not conform to former specifications.

For the first time in many years, an opportunity now is afforded to settle the vexatious question of higher sulphur and phosphorus tolerances by actual service tests. The increased rejection limits will be continued for the period of the war and upon its termination, consumers undoubtedly will have collected a large amount of valuable data that will prove whether they or the steel manufacturers have been right in their contending attitudes. Within the past few years steel producers have conducted laboratory tests on a large scale to ascertain the effects of increased sulphur and phosphorus, and without exception they have established the fact that slight increases of these elements have not proved harmful to the materials, nor impaired their physical properties.

It is contended by some steel manufacturers that the producers themselves were largely responsible for creating the demand for low sulphur and phosphorus. Abnormally low percentages were carried into the specifications, largely by the insistence of the consumers. Several decades ago many steel plants were favorably located as regards low sulphur fuels, but with the decline in the natural gas supply, the problem of producing low sulphur material has become increasingly difficult. The sulphur range in available fuels is gradually increasing and with the selection of coal from desirable veins and regions practically eliminated by the transportation problem induced by the war, it seems doubtful now if the former low sulphur limits will again prevail. The shortage of low phosphorus ores also introduces another question regarding the ability of the steel producers to meet as low percentages of this element, even after the war, as have prevailed heretofore.

Why the representatives of the railroads in attendance at the annual meeting of the Testing Society objected to the acceptance of the higher sulphur rejection limits for locomotive firebox steel after making this concession for locomotive boiler tubes, was not explained. The service to which both materials are put are equally severe and important. And it is predicted that if the higher sulphur steel gives a good account of itself for tubes, it is equally certain to do so in firebox material.

Edgar Marburg's Monument

EDGAR MARBURG is dead, but his great work in standardizing specifications for engineering materials will live and outlast the most colossal pile of marble and granite that might be erected to his memory. That his passing away should have been announced in the midst of the most successful meeting of the Society which he was instrumental in placing in a ranking position among technical organizations of the world was one of the perversities of fate.

To maintain interest in an organization such as the American Society for Testing Materials, whose membership consists largely of producers and consumers with specification provisions in constant conflict, demanded the services of a diplomat. To increase the enrollment from less than 200 to over 2000 represents the achievement of a master organizer. To serve without bias or prejudice, the opposing interests of manufacturers and users in the compilation of engineering standards involved rugged honesty. And

to carry on the tremendous detail of this organization meant great personal sacrifice, boundless enthusiasm, untiring zeal and energy. In Edgar Marburg was combined all of these attributes.

Machine Tool Business of the Future

NEVER in the history of the world have so many machine tools been produced in a given time than have been made since the beginning of the European war. Companies which were content to put out a limited number of a few standard models a year and as a rule carried but few finished tools in stock, have been rushed night and day to fill orders from plants both in this country and abroad, to turn out millions of shells and other necessities of present-day warfare.

This unprecedented production of machine tools has led many to predict that this line of manufacture will suffer a relapse after peace is declared, owing to the fact that the market will be tremendously overstocked. A careful analysis of the subject, however, will show that this statement is a fallacy.

It must be borne in mind that many of the tools made today are the result of hurried construction which will result in much shorter life than would be assured had the same machines been made in ordinary peace times. This statement is not meant as a reflection upon machine tool manufacturers at large for, as a matter of fact, many builders who have been in the business for a score of years or more realize that they have a reputation to uphold and they see to it that all tools that pass the final inspector are up to standard in many respects. On the other hand, it cannot be denied that thousands of machines that are being put on the market daily by comparatively new plants are not as perfect in design and construction as might be desired. This promises to result in a comparatively short life for these tools.

Again, a machine tool that is used night and day and worked to its maximum efficiency, cannot reasonably be expected to last as long as a similar unit operated in peace times. Further, many of these war tools are used as one-operation machines. It is well known that a precision machine tool that is devoted exclusively to one purpose, deteriorates rapidly. A plain grinder employed exclusively for grinding crankshafts is a fair example. After a few years of this service, the machine is fit for nothing else because the wear to which it has been subjected, is of such a nature that it is wholly unfitted for first-class general service.

A turret lathe for example that has been used exclusively on shell work during a long period of maximum production, will be worn to a point where it would prove practically useless for any purposes other than unimportant roughing operations. This rule holds true in the case of engine lathes, shapers, boring mills, milling machines and other tools that are being placed on the market in large lots at present.

After the war is over, it is safe to predict that 90 per cent of the machine tools turned out to meet war emergencies will be destined for the discard or at best, to be rebuilt and again placed on the market as second-hand machines. The demand for tools for the great work of reconstruction that, to all indications, will follow in the wake of peace, will create a tremendous demand for machine tools of the best design and workmanship—tools that will give efficient results for years to come. In view of this, the future of the business, it would seem, is brighter at the present time than it has ever been. It is bound to remain a prosperous industry for years to come.

Guarding Manpower for Production

ANNOUNCEMENT that comprehensive measures will be attempted by the United States employment service to relieve the scarcity of machinists is indeed welcome news to manufacturers. Unquestionably, manufacturers will co-operate with the employment service to the fullest measure in this effort, for they themselves have been working toward the same end. The employment service seeks, as among its chief remedial measures, a deferred classification for skilled machinists registered in the draft and furloughs for skilled machinists already inducted into military service.

When war was first declared, industrial leaders and members of the engineering profession urged that steps be taken against the indiscriminate enrollment of machinists and other artisans in the rank and file of the army and navy. However, their appeals went unheeded, and today there is scarcely a manufacturer whose plant operations are not greatly affected by the present labor situation. In answer to their protests, they have been assured from time to time that no real shortage of skilled workmen prevailed, and that the problem was one chiefly of adjustment. They also have been told that despite the extent of the country's mobilization for the army and navy and side-activities, little more than 7 per cent of those engaged in gainful occupations have been affected, thus indicating the withdrawal of a relatively small percentage of machinists from industry.

However, manufacturers, despite the possible correctness of this statement and granting the need for better adjustment, have had only to look to their own greatly reduced plant operations to know that in practice, a severe shortage of machinists does actually exist. With the situation as critical as it is today and assuming that there is a comparatively small percentage of machinists in the various branches of military service, what will be the conditions later when at least twice the present number of men are under arms? The United States employment service, if successful in this effort, will indeed have performed a great service to industry.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE AND IRON ORE PRICES ON PAGE 64

PIG IRON

Bessemer, valley	$35.20
Bessemer, Pittsburgh	36.50
Basic, Pittsburgh	33.40
Basic, eastern Pa.	32.00
Basic, Buffalo	32.00
Malleable, Pittsburgh	34.90
Malleable, Chicago	33.50
Malleable, Buffalo	33.50

GOVERNMENT SCHEDULE

1.75 to 2.25 silicon (No. 2 foundry, No. 2 plain, and No. 3 southern), $33 furnace base.

2.25 to 2.75 silicon (No. 2X, No. 1 Northern foundry, and No. 2 southern), base plus 50c.

2.75 to 3.25 silicon (No. 1X, No. 2, soft), base plus $1.50.

Over 3.25 silicon, $34.50, plus $1.00 for each ½ per cent of silicon.

No. 1X, Phila.	35.25 to 35.50
No. 2 foundry, Pittsburgh	34.40
No. 2 foundry, Cleveland	33.00
No. 2 foundry, Ironton	33.00
No. 1 foundry, Chicago	33.50
No. 2 foundry, Chicago	33.00
No. 2X foundry, Phila.	34.25 to 34.50
No. 2X foundry, N. J. tide	34.25 to 34.50
No. 2X foundry, Buffalo	33.50
No. 2 plain, Philadelphia	33.75 to 34.00
No. 2 plain, N. J. tide	33.75 to 34.00
No. 2 southern Birmingham	33.00 to 33.50
No. 2 southern, Cincinnati	37.10
No. 2 southern, Chicago	38.50
No. 2 southern, Phila.	40.10
No. 2 southern, Cleveland	38.50
No. 2 southern, Boston	41.00
No. 2 southern, St. Louis	39.75
Virginia, No. 2X, furnace	33.50
Virginia, No. 2X, Phila.	37.60
Virginia, No. 2X, Jersey City	37.90
Virginia, No. 2X, Boston	38.20
Gray forge, Pittsburgh	33.40
Silveries, 8 per cent, furnace	45.50
Silveries, 8 per cent, Chicago	48.50
Low phos. standard, Phila.	56.00
Low phos. Lebanon, furnace	50.00 to 52.00
Low phos., Pittsburgh standard	54.40
Charcoal, Superior, Chicago	37.70 to 38.00
Charcoal, Superior, Buffalo	37.50
Charcoal, southern to 2 per cent silicon	43.00

COKE

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

FERROALLOYS

Ferromanganese, 70 per cent delivered	250.00
Spiegel, 16 per cent fur., spot	75.00
Spiegel, contracts, furnace	75.00
Ferrocarbon titanium, carloads, maker's plant	200.00
Ferrosilicon, 50 per cent, second quarter, Pitts.	150.00 to 160.00
Ferrosilicon, 50 per cent, Pitts., remainder of 1918	150.00 to 160.00
Bessemer ferrosilicon, 10 per cent.	55.00
Bessemer ferrosilicon, 11 per cent.	58.30
Bessemer ferrosilicon, 12 per cent.	61.60

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

SEMIFINISHED MATERIAL

BILLETS AND BLOOMS

Open-hearth, Pittsburgh	$47.50
Open-hearth, Philadelphia	51.30
Open-hearth, Youngstown	47.50
Bessemer, Pittsburgh	47.50
Bessemer, Youngstown	47.50
Forging, Pittsburgh	60.00
Forging, Philadelphia	63.80

SHEET BARS

Open-hearth, Pittsburgh	$51.00
Open-hearth, Youngstown	51.00
Bessemer, Pittsburgh	51.00
Bessemer, Youngstown	51.00

SLABS

Pittsburgh and Youngstown.	$50.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$57.00
Grooved skelp, Pittsburgh	2.90c
Sheared skelp, Pittsburgh	3.25c

SHAPES, PLATES AND BARS

(In cents per pound)

Structural shapes, Pitts.	3.00c
Structural shapes, Phila.	3.23c
Structural shapes, N. Y.	3.245c
Structural shapes, Chgo.	3.27c
Tank plates, Chicago	3.52c
Tank plates, Pittsburgh	3.25c
Tank plates, Philadelphia	3.48c
Tank plates, New York	3.495c
Bars, soft steel, Pittsburgh	2.90c
Bars, soft steel, Chicago	3.17c
Bars, soft steel, Chicago	2.90c
Bars, soft steel, New York	3.145c
Bars, soft steel, Phila.	3.13c
Bar iron, Phila.	3.73c
Bar iron, Cleveland	3.67c
Bar iron, New York	3.745c
Bar iron, Pittsburgh	3.50c
Hard steel bars ,Chicago	3.00c

RAILS, TRACK MATERIAL

Angle bars, Pittsburgh base.	3.25c
Angle bars, Chicago base	3.25c
Standard bessemer rails, mill	$55.00
Stand. open-hearth rails, mill	57.00
Light rails, 25 to 45, mill	3.00c
Relaying rails, light, St. L.	60.00 to 67.00
Spikes, railroad, Pitts.	3.90c
Track bolts, Pittsburgh	4.90c
Track bolts, Chicago	5.115c
Tie plates, Chicago	3.25c

WIRE PRODUCTS

(Per 100 lbs. to jobbers; retailers 5c more)

Wire nails, Pittsburgh	$3.50
Coated nails, Pittsburgh	3.45
Plain wire, Pittsburgh	3.25
Galvanized wire, Pittsburgh.	3.95
Polished staples, Pittsburgh.	3.65
Galvanized. staples, Pbgh.	4.35
Barb wire, painted, Pitts.	3.65
Barb wire, galvanized, Pitts.	4.35
Cut nails, Pittsburgh	4.00

CHAIN, PILING, STRIP STEEL

(In cents per pound)

Chain. 1 in. proof coil, Pitts.	7.50c
Sheet piling, base, Pitts.	4.00c to 5.00c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 6.50c.

Market Report Index

	Page
Weekly Market Review	1
Pig Iron	5
Coke	6
Scrap	8
Ferroalloys	9
Nuts, Bolts, and Rivets	9
Bars	9
Semifinished Steel	10
Wire	10
Tin Plate	11
Structural Shapes	11
Sheets	12
Plates	12
Iron Ore	13
Railroads	16
Iron Ore	16
Nonferrous Markets	16
Coke By-Products	51
Machine Tools	54

SHEETS

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c
No. 28, open-hearth, Chi.	5.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	5.00c
No. 28, bessemer, Pitts.	5.00c

GALVANIZED

No. 28, open-hearth, Pitts.	6.25c
No. 28, bessemer, Pitts.	6.25c
No. 28, open-hearth, Chi.	6.52c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	4.25c
No. 10, bessemer, Pitts.	4.25c
No. 10, open-hearth, Chi.	4.52c
No. 10, open-hearth, Phila.	4.48c

TIN PLATE

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.75

IRON AND STEEL PIPE

Base Pittsburgh

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
¼ to 3 in., butt, steel	51	37½
¼ to 3 in., butt, iron	33	17

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	30
Iron, 3½ to 4½ inches, c. l.	12½

CAST IRON WATER PIPE

(Class B Pipe)

Class A pipe is $1 higher than Class B.

Four-inch, Chicago	65.05
Six-inch and over, Chicago	62.05
Four-inch, New York	64.35
Six-inch and over, N. Y.	61.35
Four-inch, Birmingham	58.00
Six-in. and over, Birmingham	55.00

HOOPS, BANDS, SHAFTING

Hoops, Pittsburgh	3.50c
Bands, Pittsburgh	3.50c
Hot rolled strip steel, Pitts.	3.50c
Shafting, Pitts., carloads	17 off to list
Cotton ties, July, per bundle	$1.93

RIVETS

Structural rivets, Pittsburgh.	4.40c
Boiler rivets, Pittsburgh	4.50c
Rivets ⅞ in. & small., Pitts.	50 and 10 off

NUTS AND BOLTS

(Delivered within 20-cent freight radius)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	50–5 off
Cut thread	40–10–5 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50–10–5 off
Cut thread	50–5 off
Larger and longer	40–10 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	60–10–10 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	70–5 off
Gimlet and cone point lag screws	50–10 off

NUTS

Hot pressed, square blank	2.50c off
Hot pressed, square tapped	2.30c off
Hot pressed, hexagon blank	2.30c off
Hot pressed, hexagon tapped	2.10c off
Cold pressed, square blank	2.25c off
Cold pressed, square tapped	2.00c off
Cold pressed, hexagon blank	2.25c off
Cold pressed, hexagon tapped	2.00c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Quotation on leading products July 3, average for June 1918, average for April 1918, and average for July, 1917. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices July 3, 1918	Average prices June, 1918	April, 1918	July, 1917
Bessemer pig iron, Pittsburgh	$36.60	$36.35	$36.15	$57.95
Basic pig iron, Pittsburgh	33.40	33.20	32.95	53.20
*No. 2 Foundry pig iron, Pitts.	34.40	34.15	33.95	55.95
*No. 2, Foundry pig iron, Chi.	33.00	33.00	33.00	55.00
Lake Superior charcoal, Chicago	37.70	37.50	37.50	59.50
Malleable, valley	33.50	33.50	33.50	55.00
Malleable, Chicago	33.50	33.50	33.50	55.00
**Southern, No. 2, Birmingham.	33.50	33.50	33.50	46.00
*Southern Ohio No. 2, Ironton	33.00	33.00	33.00	54.25
Basic, eastern Pa.	32.00	32.00	32.00	50.75
**No. 2X Virginia, furnace	33.50	33.50	33.50	52.25
**No. 2X foundry, Philadelphia	34.50	34.25	34.25	54.25
Ferromanganese, 70%, delivered	250.00	250.00	250.00	430.00
Bessemer billets, Pittsburgh	47.50	47.50	47.50	100.00
Bessemer sheet bars, Pittsburgh	51.00	51.00	51.00	105.00
Open-hearth sheet bars, Pitts.	51.00	51.00	51.00	105.00
Open-hearth billets, Pitts	47.50	47.50	47.50	100.00
Steel bars, Pittsburgh	2.90	2.90	2.90	3.87
Steel bars, Chicago	2.90	2.90	2.90	4.50
Iron bars, Philadelphia	3.73	3.685	3.50	4.759

	Prices July 3, 1918	Average prices June, 1918	April, 1918	July, 1917
Iron bars, Cleveland	$3.64	3.64	3.64	4.50
Iron bars, Chicago mill	3.50	3.50	3.50	4.50
Beams, Chicago	3.00	3.00	3.00	5.88
Beams, Pittsburgh	3.00	3.00	3.00	4.50
Beams, Philadelphia	3.23	3.185	3.185	4.909
Tank plates, Pittsburgh	3.25	3.25	3.25	5.62
Tank plates, Chicago	3.25	3.25	3.25	9.64
Tank plates, Philadelphia	3.48	3.435	3.435	10.159
Sheets, blk., No. 28, Pitts	5.00	5.00	5.00	9.00
Sheets, blue anld., No. 10, Pitts.	4.25	4.25	4.25	8.50
Sheets, galv., No. 28, Pitts	6.25	6.25	6.25	10.25
Wire nails, Pittsburgh	3.50	3.50	3.50	4.00
Connellsville furnace coke	6.00	6.00	6.00	12.50
Connellsville foundry coke	7.00	7.00	7.00	13.00
Heavy melting steel, Pitts	29.00	29.00	29.00	40.25
Heavy melting steel, eastern Pa.	28.50	28.50	28.30	37.00
Heavy melting steel, Chicago	29.00	29.00	28.63	35.50
No. 1 wrought, eastern Pa.	34.00	34.00	34.00	54.00
No. 1 wrought, Chicago	33.50	33.50	33.50	43.75
Rerolling rails, Chicago	34.00	34.00	34.00	46.25

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

(For Additional Prices See Page 64.)

Iron Allocations Growing Rapidly

Institute Committee Allots Total of 165,000 Tons Since May 1 and Big Tonnage Now Pending—Low Phosphorus Demands in East Heavy—Survey Still Incomplete—Sales For 1919 Delivery

Cleveland, July 2.—Allocations of pig iron for government purposes by the committee on pig iron, iron ore and lake transportation continues to grow heavily, and since this procedure was inaugurated, about May 1, orders for approximately 165,000 tons have been distributed. These include 63,000 tons of basic; 45,000 tons of foundry; 21,000 tons of low phosphorus; 19,000 tons of bessemer; 17,000 tons of malleable, and the remainder of charcoal, bessemer and ferrosilicon, silveries, etc. During the past two weeks there have been over 100 requests upon the committee for tonnage for iron and 108,000 tons have been allocated in that period. The week's distribution has been large. It included 9000 tons of basic for Newark, N. J., and 1500 tons for Verona, Pa.; 12,00 tons of low phosphorus for different consumers in the Pittsburgh district; 6700 tons of bessemer for a West Virginia consumer, 4900 tons for a western Pennsylvania plant and 1700 tons for three other users; 9000 tons of malleable for a middle western carbuilder and 1400 tons of the same grade for Indianapolis delivery; and 2100 tons of foundry and 600 tons of bessemer for the Washington navy yard. New requests received by the committee during the week have kept up with the record of growing tonnage. About 50 separate matters now are up for action. Five or six furnaces are yet to return to the committee their questionnaires showing how their product is being consumed but promises have been obtained that these will be in hand within a few days. Makers are using the data submitted by individual consumers in shipping iron to the latter. The tonnage is being regulated by the amount of essential work reported. Continued inquiry for 1919 delivery is apparent but no sales are reported.

Domestic Buyers Anxious

Boston, July 1.—The pig iron trade is deeply interested to know the government's intention concerning the consumer who is doing a strictly domestic business. There are various rumors afloat, but the trade is in doubt and anxiously waiting for a classification and the determining factor—Class A priority. The situation is stagnant as far as new sales are concerned. Customers still are clamoring for shipments, but the government is taking so much iron that domestic contracts long placed must suffer for an indefinite period.

Tonnages by Allocation

Pittsburgh, July 2.—Inquiries for pig iron still are coming to blast furnaces but tonnages now are being provided only by allocation through the war industries board and no offerings are being made. Steelmaking grades are in greatest demand and there also is a pressing demand for foundry iron. The trade is interested in the report that the war industries board may ask furnaces now making foundry iron to change to the production of steelmaking grades. This plan is said to be under consideration by J. Leonard Replogle, director of steel supply, but if any action is taken it will not be done until complete data have been compiled showing an estimate of steelmaking iron that is needed and the increase that may be expected by changing furnaces from foundry to bessemer production. It

is also desired not to interrupt the supply of foundry iron for essential consumers. It is reported that one plan under consideration is to transfer orders for foundry from northern to southern furnaces and to have the former produce steelmaking grades. Not over two or three furnaces in this district, however, are making foundry iron, so any change in production would not make a great difference so far as this territory is concerned.

Push War Orders Ahead

Buffalo, July 2.—Buffalo furnaces still are unable to accept new orders except government emergency projects which cannot wait, in which event the entire schedule is set back in favor of the urgent case. There is no other iron to be sold on new orders and furnacemen are unable to form any estimate as to when they will have any material to dispose of in the open market. Government orders are being looked to, to consume the available capacity of the furnaces for an indefinite time. What was once approximately correct, that the government was taking 100 per cent of furnace capacity is now literally correct. Plants are concentrating on getting out the nation's requirement with the best dispatch. Sometimes a rush order comes in for a certain grade and when the furnace has not that particular silicon content on hand a problem looms, but the furnaces immediately go to work to get out the proper grade and satisfy the requirement. Almost all the questionnaires have been turned in, consumers understanding pretty thoroughly that there is a good possibility of their being cut off from metal altogether unless they file a report. Local producers have not yet received the official government instructions regarding priorities but are using great discretion in all shipments made. Nothing definite has been heard locally with regard to the British government inquiry for 180,000 tons of basic.

Takes Much Prompt Iron

Chicago, July 2.—Orders from the pig iron committee to be shipped immediately to consumers engaged on essential government work are being received by Chicago producers, and within recent days a total of at least 20,000 tons has been booked. Delivery of this iron necessarily delays shipment on regular contracts. Expected reduction in productive capacity due to the necessity of renewing furnace linings is beginning to appear and one stack at the Mayville plant of the Northwestern Iron Co., Mayville, Wis., was blown out last Friday for relining. South Chicago furnaces, which have been pushed to the utmost for several years, are not in the best condition and it is expected that one or more stacks may be blown out within the next few weeks. However, they are being nursed and every effort made to keep them in active production as long as possible. The new stack at Indiana Harbor is now expected to go in during September. Inquiry for pig iron for delivery during first half of 1919 is increasing steadily but has not resulted in a heavy buying movement. Such business is being booked subject to whatever regulations or changes in prices as may be made by the government at any time prior to its delivery. Southern furnaces are not selling except an occasional cast of off-iron. It is coming to be believed that southern furnaces will have nothing further to sell for 1918 delivery except for last quarter. Some furnaces which had not sold anything for last half find their undelivered tonnages from first half sufficient to last them into third quarter. Under these circumstances they are not ready at this time to take further business. Inquiry for Lake Superior charcoal iron for 1919 delivery has been light and is not a factor. Producers of this iron are not ready to take orders for that delivery at this time.

Furnace Labor Undependable

Cincinnati, July 1.—The allocation of iron produced both in the south and in southern Ohio has been confined almost entirely to basic for urgent war work. As far as foundry iron is concerned the furnaces, and their representatives are depended on to see that the metal goes to essential industries. An evidence that they are doing their duty in this respect is the urgent call for prompt iron from a melter who had previously bought enough metal to carry him through the remainder of the year. It is reported that the firm that sold this iron called for priority orders before they would let the metal go forward. New sales are confined to the usual carlots of off iron. A somewhat disquieting feature of the southern situation is that the advances in costs of ore and coke, due to the freight rate increase has caused some talk of a suspension of operation on the part of a few Tennessee furnaces. The labor question is by no means a small factor there, although it is probably not causing quite as much trouble as the unreliability of unskilled workmen in southern Ohio. Frequently it is stated that some of the men work three days and then lay off the remainder of the week. The traffic departments of the pig iron firms are less handicapped in tracing cars as shipments are moving more promptly. The new freight rates, however, cause considerable trouble and confusion but this is expected to be cleared up soon.

Southern Iron Diverted

St. Louis, June 29.—Users and producers of pig iron in this district are rapidly adjusting to new conditions concommitant with full government control. Manufacturers of nonwar materials, who began to feel some encouragement last week because of improvement in shipments from the south, begin to realize fully now that it is only a matter of time before they will be in the same condition as the basic users. Already there have been some diversions of tonnages in transit, and Birmingham furnaces have advised their clients who have not got government contracts, that they cannot expect any tonnage for an indefinite period. Thus far no plants in the district have closed down, but they are running very close. A canvass this week of leading consumers elicited the information that virtually all had filled and dispatched their questionnaires to Washington. There have been no sales of any grade during the past week, selling agencies being deep in the problems of distribution. Every possible argument is being used by manufacturers of various articles to get them included within the preferred class. Intervention of the food administration has been successfully invoked by two manufacturers to get a war rating for their products. Ramifications of war requirements are so far reaching that a great diversity of articles are getting through, which at first glance would hardly be classified as essential to winning the conflict.

Complain of Freight Raise

Birmingham, Ala., July 2.—Southern producers of pig iron manufacturers are a little disappointed at the price schedule adopted at Washington because of the increased freight rates on raw material. Representative iron manufacturers have gone to Pittsburgh on the matter of prices and others to Washington in reference to the freight rates on raw material. Briefs have been prepared and following a meeting here this week, there will be presented before Judge Prouty of the interstate commerce commission with the hope of getting relief. Production of iron still is lagging and expectations as to output will not be reached. Indifference of labor is again complained of

and an accident or two at furnaces have been factors. Shipments are steady and there is further reduction in the stocks on hand. Some few sales have been made, sanctioned by the government, but in the main, in small lots. No big business can be handled in this district. It is a task to keep operations at anything like reasonable speed.

Low Phosphorus Orders Heavy

Philadelphia, July 2.—Finding it impossible to place orders, consumers are appealing actively for iron to the government with result that allocations are increasing rapidly in number and tonnage. Practically all eastern makers received some allocations during the past couple of weeks ranging from carloads upward and involving various grades. Some makers of foundry iron have received allocations equivalent to two months' production. The largest allocation is 11,890 tons of standard low phosphorus iron for the Crucible Steel Co. of America for second half delivery, which has been divided between two eastern and one western maker. Several other lots of low phosphorus have been distributed involving 2000 tons and less. Further large allocations are in sight, including 15,000 tons of standard low phosphorus for the Midvale Steel & Ordnance Co.; 7500 tons for the Bethlehem Steel Co.; 3000 tons for the Carbon Steel Co., and 3000 to 5000 tons for the John A Roebling's Sons Co. The Eastern Steel Co again is blowing its larger furnace at Pottstown on standard low phosphorus. The steel director has asked low phosphorus producers to submit all tonnages before booking them. As result of the last canvass, makers say that enough low phosphorus iron is being produced to meet all essential requirements. The government has been inquiring for 2100 tons of foundry iron for a navy yard. Stovemakers continue among the anxious customers who have not heard from the priority committee whether their requirements come within the essential list. They have asked to be included under the food class.

Cotton Ties Fixed

Pittsburgh, July 1.—Prices for cotton ties for the third quarter have been fixed in harmony with the level set at the opening of the season for second quarter delivery. The price of July shipment, therefore, is $1.93 per bundle of 45 pounds in lots of 3000 bundles and over, with a charge of 2c per bundle for smaller quantities, 1c per month being charged for storage.

Coke Supply Meets Needs

Blast Furnaces Now Make Few Complaints—Labor Situation Improving—Numerous Contracts Expiring, Few Renewals

Pittsburgh, July 2.—Blast furnaces are being kept well supplied with coke tonnages, and only in rare instances are complaints heard on account of the shortage of fuel. The car supply in the Connellsville region is being maintained at practically 100 per cent and exceeds the loading capacity. While shipments during the past two weeks have been slightly less than they were prior to that time, the falling off has been negligible. Laborers in the Connellsville region will work on July 4 in order to insure an uninterrupted movement of coke to blast furnaces and foundries. The labor situation in the region, while not all that is desired, appears to be improving. The Carnegie Steel Co. is operating two batteries of 64 ovens each at its Clairton by-product plant and it is expected to add one battery a week to the active list. After the plant has begun to produce tonnage in large volume it is understood that laborers who have been engaged at the Frick beehive ovens in the Connellsville region will be released to work at other ovens in that district. Virtually no free offerings of either furnace or foundry coke are being made and no new contracts, so far as can be learned, are being closed. Numerous contracts expired with the end of June. Production for the week ending June 30 totaled 344,950 tons as compared with 342,970 tons for the preceding week, according to *The Connellsville Courier*.

Supply is Daily One

Boston, July 1.—There is an ample supply of coke for New England needs, but it is a daily supply, as the trade understands, with no stocking up for the future. The U-boat anxiety has passed. A representative of the Northeast Coal Co. is in Washington for a few days and it is expected that there will be important results from conferences that are being held with government officials.

Southern Stacks Short

Cincinnati, July 1.—The numerous complaints that are being registered on coke deliveries are not all made without some reason. However, the efforts of the foundry coke consumers to accumulate a supply probably has something to do with the number of these demands. The car supply is said to be sufficient to move all the fuel offered, but labor shortages reported in all fields hold up shipments. Southern furnaces are having some trouble in securing sufficient coke to enable them to operate their stacks to full capacity. The improved car supply has helped the northern furnace coke consumers but they are not able to put by a supply for a "rainy day".

Southern Coke Unobtainable

St. Louis, June 29.—All grades and varieties of coke continue in urgent demand, especially metallurgical. The more liberal allowance of cars to the Connellsville and Virginia districts is reflected in somewhat better contract deliveries here and to the west but none of the makers is near schedule on shipments. Several melters in the southwest, buying through this market, report the arrival of small tonnages of foundry coke, the first to materialize aside from a single car from time to time, since last fall. So far as consumers are concerned, the advance in freight rates have been entirely ignored, the only consideration being to get the coke.

Will Work on Fourth

Birmingham, Ala., July 2.—While improvement in the production of coal and coke is announced for the past week, a lack of these products still is noticeable in the general market. Appeals are still being made to labor at both coal mines and coke ovens to keep at work the full week and the promise is that on Thursday of this week the celebration of the Fourth will be by a magnificent production. Resolutions have been adopted in many mining camps that there will be no cessation for the day. The Sloss-Sheffield Steel & Iron Co. has surrendered the Sayre mines and ovens, operated under lease for several years, to the Gulf States Steel Co., which purchased the property. The Sloss-Sheffield company has renewed its contract with the state for the use of convicts, increasing the number from 300 to 450 maximum. The company this year will set about constructing a by-product coke oven plant, but some question in selecting the site has presented itself recently. The local street railway and gas company has been offered the gas if the plant is erected in the immediate Birmingham district and the government offers to take all by-products save coke, if the plant is erected at Sheffield near Muscle Shoals.

Steel Demand Tops Supply

Open-Hearth Plants Substitute Other Grades For No. 1 Heavy Melting—Freight Advance Upsets St. Louis Market

FOR COMPLETE PRICES SEE PAGE 64

Chicago, July 2.—Demand for heavy melting steel and other open-hearth grades is greater than the supply, as much less of this material is coming out now than usual. Dealers having short sales to cover are meeting difficulty in obtaining their requirements readily and most consumers are ready to take on any tonnage offered of these grades. Rolling mill grades are slow and in slack demand, a reflection of the lack of activity in bar iron. Rerolling rails continue scarce and all tonnages are quickly absorbed. An unusual condition is arising in the method of marketing railroad scrap as many roads are now placing in their lists considerable tonnages of mixed scrap. This indicates that either labor is lacking to prepare this for the market or railroads have less of an eye to profits than formerly and are willing to let this go at a lower price than it would command if sorted. Nearly all tonnage of this sort is available only for scrap dealers who have yards. Railroad offerings as a rule are much below normal. The Chicago & Northwestern offers 5200 tons, including 750 tons of steel rails and 600 tons of wrought scrap; the Chicago & Alton 3000 tons, including 300 tons of steel rails and 600 tons of mixed scrap; the Pere Marquette 2000 tons of mixed scrap.

Labor Factor Increases

Boston, July 1.—Movements in scrap are still heavy, but the labor situation is becoming increasingly serious day by day. The trade is proceeding very cautiously with orders and is way behind in deliveries. The railroad situation is not so embarrassing as it was a few weeks ago.

Substituting for Steel

Philadelphia, July 2.—An active demand for all grades of scrap continues, but the shortage prevents much business being closed. Due to the insufficient supply of heavy melting steel, steel works for the first time are buying forge and bundle sheet scrap. The prices being paid for these grades range from $28 to $29, delivered, representing No. 1 forge quality. Blast furnace borings also are being bought as a substitute for steel at $18.50 to $19.50, delivered. The subcommittee on scrap is having difficulty in concluding an equitable allocation of the tonnage of Italian heavy melting steel. About 15 consumers are participating so that although the total tonnage is large, no user is receiving as much as wanted. The new freight rate on scrap from New England to eastern Pennsylvania is $3.50 per gross ton.

All Points Affected

New York, July 2.—Trading in iron and steel scrap in this district proceeded with little irregularity during the past week. Demand for all grades continued strong with supplies in fairly good volume considering the steady drain of the past month or so. All uncertainty over freight rates now is eliminated, it being definitely ascertained that the recent increase of 25 per cent affects all points.

Market is Dull

Pittsburgh, July 2.—Dullness continues to characterize the market for scrap. While there still is considerable direct dealing between consumers and producers, it appears to show a falling off and some mills which were buying direct now are trying to get tonnages through dealers and are willing to pay them the commission of 3½ per cent. Dealers report that the leading grades of scrap, which are in heavy demand, are extremely scarce, and that their stocks are low. There has been some buying by consumers in this district from outside districts, making it necessary for the users to pay freight rate differentials and to obtain permission to make these transactions from the subcommittee on scrap iron and steel of the American Iron and Steel institute.

Government to Act Shortly

Buffalo, July 2.—There is no change in the price situation in iron and steel scrap. The demand for heavy melting steel exceeds the supply. This scrap is picked up as fast as it appears so that the yards are bare. Indications would point to the fact that the government intends very shortly to distribute the scrap of the country —at least that scrap which is produced by manufacturers who are making shells on government contract. It is understood that an order has been received by manufacturers not to sell their production of scrap for over 30 days' delivery. Up to a short time ago dealers were swamped with offers for shoveling machine shop turnings for delivery to Cleveland and valley points for blast furnace and open-hearth purposes, quotations being the government price for machine shop turnings. It is understood action was taken on this violation of government prices and machine shop turnings are now finding their way to these consuming points at the $19 price. Four lists from eastern roads due to come out this week have not been closed.

Turnings Are Sold

Cleveland, July 2.—One producer has disposed of his machine shop turnings for the coming three months at slightly more than $18, it is reported. Otherwise, scrap iron and steel trading here has not assumed the proportions expected as a result of the settlement of prices for the third quarter. Valley consumers of heavy melting steel are in this market but the few tons that dealers are able to pick up do not get as far away as Youngstown. Some firmness has been shown by bundled sheet scrap, No. 1 cast, pipes and flues, machine shop turnings, large drop forge flashings, axle turnings and melting rails. New York Central lists for the lines both east and west of Buffalo, and one of the Wheeling & Lake Erie, close July 5.

Foundries Want to Buy

Cincinnati, July 1.—The prediction that an allocation of scrap would be in effect soon has not materialized. However, the gradual growing scarcity of material may bring about an allotment of certain kinds of steel scrap to companies engaged in war work. This contingency is not expected to be necessary at an early date because stocks in hand should be sufficient to take care of urgent needs for several months. One feature now is the willingness of many foundries to buy ahead but future contracts are hard to make.

Freight Raise Upsets Trade

St. Louis, June 29.—The scrap iron and steel trade here, together with certain mills and foundries, were thrown into a panic this week by announcement of an arbitrary advance in rates by the St. Louis Terminal Railway association ranging from 200 to 600 per cent. The scrap increases actually range from 200 to 700 per cent. The result has been a temporary and total paralysis in business and neither buyers or sellers are venturing to make a move. The new schedule covers tonnage handled between St. Louis and the east side section of the industrial district, including East St. Louis, Madison, Gran-

ite City and Venice, Ill. At a mass meeting of shippers on Thursday formidable protests to the railroad administration and interstate commerce commission were prepared. According to leading scrap interests the increase in rates spells ruin to the local scrap industry. Members of leading scrap interests will appear personally before the interstate commerce commission and railroad administration at Washington in an effort to have the new rates abolished. There is a differential of only 65 cents in the cost of shipping a gross ton of scrap from St. Louis to East St. Louis and Granite City, and from St. Louis to Chicago. Shippers claim the Terminal association has taken advantage of Order No. 28, of the railroad administration, allowing an increase in long-haul freight rates. It is estimated fully 1,000,000 tons of scrap are shipped across the river to the east side cities annually. The rate advance came when an excellent improvement in the general demand had just gotten under way. Dealers reported good buying by all melters. Rolling mill grades were in especially good request.

1919 Spiegel

Is Sold at $75, Furnace—All Ferroalloys Are Quiet

New York, July 2.—An initial sale of spiegeleisen for delivery in the first half of 1919 closed this week involved 200 tons of 16 per cent and was placed at $75, furnace. The ferroalloy market generally is quiet, the sales aggregating less than 2000 tons of spiegeleisen and 1000 tons of ferromanganese. Fifty per cent ferrosilicon is quiet and unchanged. Ferrotungsten is now quoted from $2.30 to $2.35, furnace, per pound. Ferrochrome is unchanged.

Brazilian Ore Sold

Philadelphia, July 2.—Several thousand tons of Brazilian manganese ore, part of which now is afloat, have been sold to domestic consumers at from $1.30 to $1.35 per unit, tidewater.

Market is Quiet

Pittsburgh, July 2.—The market for ferroalloys is quiet. Limited inquiry is out for 16 per cent spiegeleisen which now is quoted at $75, furnace, for both spot and last half tonnages. Small lots of 70 per cent ferromanganese have been sold in this district during the past week at $250, delivered. No activity has been noted in the market for 50 per cent ferrosilicon, which is quoted at $165 to $175, delivered, for spot shipments and $155, delivered, for contract tonnages.

Orders Exceed Mill Yield

Chicago Plants Heavily Loaded With Government Business—Bar Iron Volume Increases—Hard Bars Scarce

Chicago, July 2.—Steel mills in the Chicago district are receiving allocations from the government at a rate considerable in excess of production. In one instance this totals a heavy percentage on the possible production and the individual tonnage is piling up at a rapid rate. Orders from the government during the past week have been heavy in the aggregate but in small individual tonnages rather than in the heavy single lots which have been experienced shortly before. The leading interest is again on practically full operation with all of its 42 open hearths in service and only one blast furnace producing steelmaking iron out of blast. The car situation as to shipments is practically all that could be desired but fuel is not being received in sufficient volume to operate all blast furnaces. One feature causing some uneasiness is the fact that a fuel reserve for winter cannot be built up as receipts are not sufficient to care for present needs.

Demand for bar iron in this tetritory is increasing steadily but is not yet sufficiently insistent to meet the possibilities of the situation. Most inquiries and sales are in small lots and most mills have sufficient tonnage on their books for only a few weeks operation.

Hard steel bars rerolled from rails are just as scarce as rerolling rails, which are almost unobtainable. Consumers who have sought in vain to place further tonnages are not actively in the market.

Taking Good Sized Tonnages

Pittsburgh, July 2.—Makers of steel bars report that the government is taking good sized tonnages and it also is placing a fair volume of business for iron bars. Some producers of the latter are understood to be in a position to take commercial business for shipment in 60 to 90 days.

Operating at High Rate

Pittsburgh, July 2.—Makers of nuts, bolts and rivets are operating at a high rate of capacity on direct and indirect government orders and are accepting no other business. Only about 25 per cent of the 129,000,000 bolts for which the government put out an inquiry some time ago has been alloted and most of this percentage was taken from stocks.

On Government Work

Pittsburgh, July 2.—Makers of cold rolled shafting are engaged altogether on direct and indirect government work and are not accepting bookings for any other purpose. Demand for large sizes is more active than that for the smaller sizes. Deliveries are being made in from three to six weeks.

Nut Specifications Heavy

Chicago, July 2.—Consumers of bolts and nuts are inquiring for considerable material and shops are receiving heavy specifications against previous orders. All shops are busy and production is heavy. The government has not yet awarded its former large inquiry.

Some Confusion

Arises Owing to Uncertainty Over Plan to Replenish Jobbers

Cleveland, July 2.—Confusion exists with regard to the shipments of finished products to the jobbers in view of the incomplete stage of the government's proposed regulation of the middlemen. Official forms for reporting June deliveries from warehouses for essential purposes as a precedent to obtaining replacement tonnage have not yet been received. Jobbers are understood to have been advised by Washington that they will not be granted priority certificates because these are not necessary. On the other hand, certain mills have required that a priority be furnished before shipment is made. A lot of 1000 tons of small angles to be rolled from shell discards for a local jobber is tied up in this way. Further announcement is expected from Washington shortly which will clarify this situation.

Prices Not Changed

Philadelphia, July 2.—Warehouses in this district have not yet changed their prices in accordance with the recent freight rate advances and are charging practically the same as before this increase. The warehouses in this district have been receiving good deliveries, and despite the large demands upon them, have heavier stocks than two months ago.

Revise Shell Standards

New Projectile Steel Specifications Embrace British Chemical and French Physical Requirements—Dividing Up Steel—Axle Billets Placed

New York, July 3.—Further revision of shell-steel specifications is to be made soon. Copies of the revised specifications together with instructions to return them within eight days have been mailed to the various shell-steel makers throughout the country for comment. The chemical requirements are practically the same as the British specifications, while the physical requirements are similar to the French specifications. What the government aims to do is to obtain a shell steel which will have ideal machining and forging qualities and at the same time require as little heat treating as possible. A few makers are anxious to take on more shell-steel tonnage but the government continues to allot this material sparingly. Many forgers are swamped with steel which the mills have delivered away ahead of schedule, and this probably has some bearing on the government's delay. However, it is authoritatively stated that forging and heat-treating plants will have their decks clear by Sept. 1. Several makers in the Greater Pittsburgh district speeded up their mills not long ago and as a result little tonnage of shell steel remains on their books. A maker in the Mahoning valley district reports that he took on a large tonnage, the last shipment of which was to be made in November. He delivered the entire lot to a Cleveland finisher by June 15. The steel supply in the Youngstown district has become so low that one maker has dropped his 14-inch mill products. This maker also is short 20,000 tons of bessemer ingots per month and will cut production of sheet bars to 50 per cent. This promises to have a market effect on many valley sheet mills which have been getting their steel from this source.

To Award Rod Order

New York, July 1.—About 40,000 tons of wire rods for shipment to France are about to be allocated by the wire subcommittee of the American Iron and Steel institute.

Cool Weather Helps Production

Pittsburgh, July 2.—Cool weather has been an important factor in maintaining a high rate of production of steel. The demand, however, exceeds the supply. Makers of sheets are considering plans to get increased tonnages of sheet bars and last Tuesday a number of makers of sheet bars met with members of the National Association of Sheet and Tin Plate Manufacturers. Discussion was given to the proposal to distribute sheet bars more uniformly among sheet mills. Stress was laid upon the importance of producing the maximum output of sheet bars. The meeting was not largely attended, less than one-half of the sheet bar capacity being represented, but it is hoped that some action will be taken which will give relief to sheet mills. Inquiries for billets, slabs and skelp no longer are numerous for the reason that consumers appreciate that there are no offerings. Small lots of wire rods are booked occasionally by makers for regular customers who are engaged on essential work. Iron and steel plants in this district generally will suspend operations on Thursday, July 4, including all units, except blast furnaces. Even plate mills will give their laborers a holidays on that occasion. It will be the policy of some producers, at least, if not most of them, to keep their open-hearth furnaces in readiness to resume production the day following without delay. One prominent maker will close down some of the mills on the night of July 3 and not resume till July 8. This will be for making the usual summer repairs, which ordinarily require two weeks, but in view of the pressing war demands, the shutdown will be reduced to five days.

Draw Steel From Wire Plant

Cleveland, July 2.—Considerable tonnage of raw steel has been drawn on government orders from the plants of the American Steel & Wire Co. for other steelmakers and mills in this territory. This action of the government has arisen from a belief that the wire manufacturers have had a larger surplus of ingot tonnage after satisfying essential demand than certain other producers of finished products. The Bourne-Fuller Co. will furnish 3000 tons of billets to the Pollock Steel Co. for car axles under government allocation. The Central Steel Co., Massillon, O., and the United Alloy Steel Corp., Canton, O., will supply 5000 tons each for the same purpose. An interesting side light on the shortage of sheet bars was the purchase this week by one maker of several hundred tons of universal plates which will be reduced to sheets. A lot of 700 tons of odd and end sheet bars also was sold at full price.

Axle Billets Allocated

Chicago, July 2.—Allocation of billets covering the steel requirements for the large orders for axles for government cars recently distributed includes 72,000 tons for the Chicago and Cincinnati plants of the Pollak Steel Co. This company will produce 151,000 of these axles. The allotments of the billets give the Illinois Steel Co. 18,000 tons; the Inland Steel Co. and the Jones & Laughlin Steel Co., 10,000 each; the Ashland Iron & Mining Co., Ashland, Ky., 8000 tons; the United Alloy Steel Corp., Canton, O., the Brier Hill Steel Co., and the Central Steel Co., 5000 tons each; the Bourne-Fuller Co., Cleveland, and the Carbon Steel Co., Pittsburgh, 3000 tons each; the Cambria Steel Co., Johnstown, 2500 tons; the Interstate Iron & Steel Co., 1500 tons each; and the Gulf State Steel Co., Birmingham, Ala., 1000 tons.

Steel Shortage Cuts Output

Pittsburgh, July 2.—Output of cold rolled strip steel has been cut down considerably owing to a shortage of rolling material and operations are estimated at about 70 per cent of output. Priority certificates are required of consumers by the mills before they will take any bookings. Demand for direct and indirect government requirements is fairly active.

Merchant Orders

In Wire Products Rated as Food Essential—Nails Allocated

New York, July 1.—Orders for 300,000 kegs of wire nails which recently were placed by the government for delivery over the next eight months to the American expeditionary forces in France, have been canceled. About 10 per cent of this total, however, is being allocated for quick shipment abroad. About 40,000 tons of barbed wire have been allocated during the past week for shipment to France. This is in addition to 10,000 tons which recently were distributed. Shipment is to be made within the next four to five months. This tonnage some months ago had been placed; but later canceled. Wire mills have received from the priority board a definite expression which permits them to accept all merchant orders as coming under the food classification in the preference list of the war industries board. Included are wire nails,

barbed wire, staples, fence wire and other products which jobbers carry. As a result, the mills are having no difficulty in handling orders from jobbers. They are forced to inquire, however, as to what purposes the materials will be used for before they can ship to manufacturers who use wire in any form.

Requirements Cut Down

Pittsburgh, July 2.—The war department is understood to have revised the inquiry it recently put out for 300,000 kegs of nails for shipment to France and reduced the requirement to 40,000 kegs. No allocation of the revised tonnage is said to have been made, but is expected to be at once. Inquiries for 7500 tons of annealed wire and 10,000 tons of barbed wire, also for shipment to France, still are pending. Wire mills in this district are filled up for the third quarter or longer and are taking tonnages for direct and indirect government work only. Some makers are supplying nails to jobbers without requiring priority certificates but do so only to replace tonnages the jobbers have shipped on government requirements.

Some Relief

In Tin Plate by Stoppage of Certain Food Packing

Pittsburgh, July 2.—The food administration has issued instructions to packers of dried beans not to pack any more of this food until Sept. 15. Tin plate makers are not to make shipments till that date unless they get permits to do so from the food administration and can makers are granted priority certificates. Permission is made provisionally in order to take care of beans with moisture which require immediate packing. The food administration has also issued an order stopping temporarily the packing of condensed milk. This was done to conserve the sugar supply. The output of tin plate is estimated at about 90 per cent of capacity. Cool weather conditions have been favorable to large production, although output has been affected somewhat by the high temperature that has prevailed for short periods. The production for the third quarter is expected to be considerably less than that for the second quarter and manufacturers will be satisfied if it amounts to 10,000,000 base boxes.

The A furnace of the Northwestern Iron Co., Mayville, Wis., is being relined. It was blown out on June 20.

Fabricators' Orders Droop

Ship Tonnage Large But War Construction is Less and Balanced Operations More Difficult—Car Specialties Take Tonnage

New York, July 1.—Fears are beginning to be felt in well-informed quarters that before very long there will not be enough government work to keep the structural shops busy. The rate of shipments from fabricating shops now is at a rate very much greater than that at which new business is being booked. Leading fabricators now have only about half the tonnage on their books that they had a few months ago. One large interest now is devoting about 40 per cent of its capacity to the fabrication of ship steel and has enough work on hand to occupy the remaining 60 per cent for about three months. About six months ago this interest had its plants filled for six months. It is believed this example is typical of various fabricating shops. The belief prevails that considerable new government work will come out during the next few weeks owing to the new appropriations becoming available July 1. Inasmuch as the larger portion of the government structural needs already have been carried out during the past year, however, the amount of new war work from now on is expected to shrink. Bids are being received on 9000 tons of fabricated steel for the army supply base at South Brooklyn. Originally it was expected that about 15,000 tons would be required.

Bridge Work Let

Philadelphia, July 2.—Railroad tonnage is figuring somewhat more freely in the structural shape market. Lettings just made include bridge work for the Pennsylvania and Reading systems. Other tonnages are small.

Want Tonnage for Cars

Cleveland, July 2.—Demands for shape tonnage for car specialties and equipment are appearing more freely. An inquiry is current for 80,000 special I-beams for a western Pennsylvania manufacturer to be used in the production of brake beams. The government gun powder plant in Kentucky, just awarded, calls for 1000 tons of structural material.

Government Placing Orders

Pittsburgh, July 2.—Large requirements are being placed regularly by the government, especially the Emergency Fleet corporation, with fabricators. It is understood that numerous large projects are under way which will call for heavy tonnages to be placed soon. Machine builders also are taking tonnages for extensions to their plants. Fabricating capacity to be built at the request of the Emergency Fleet corporation by the McClintic-Marshall Construction Co., at Leetsdale and Pottstown, Pa., will be built and ready for operations by January, 1919, provided it is possible to secure the neccesary machine tools on time.

Building Projects Few

Chicago, July 2.—Under the present ban on structural steel for building purposes, unless absolutely essential, tonnages are few and confined principally to railroads and industrial concerns. Demand on mills for plain material for shipbuilding purposes is strong but many fabricating shops engaged on work for the Emergency Fleet corporation find they have sufficient material on hand and do not need shipments as badly as formerly.

CONTRACTS AWARDED

Two shop additions for Globe Seamless Steel Tubes Co., Milwaukee, 500 tons to Worden-Allen Co.

Electric steel foundry addition for Gerlinger Steel Casting Co., West Allis, Milwaukee, 110 tons to Northwestern Bridge & Iron Co.

Electric steel foundry for Hercules Steel Casting Co., Bay View, Milwaukee, 130 tons to Northwestern Bridge & Iron Co.

Building No. 19 and steel stack and tank for Western Electric Co., Chicago, 233 tons, to the Strobel Steel Construction Co.

Four deck plate girder spans, for the Chicago & Eastern Illinois railroad, at Milford, Ill., 145 tons, to the American Bridge Co.

Two 90-foot deck turntables, type "H" center, for the Chicago, Rock Island & Pacific railroad, at Burr Oak and Bureau, Ill., 114 tons, to the American Bridge Co.

Gun powder plant in Kentucky for government, 1000 tons to the Mt. Vernon Bridge Company.

Piers for government at Charleston, S. C., 650 tons to Levering & Garrigues Co.

Government machine shop at Scituate, Mass., 275 tons to New England Structural Company.

Mexican telegraph building, New York, 200 tons to Levering & Garrigues Co.

CONTRACTS PENDING

Repair shop for Baltimore & Ohio railroad at Cumberland, Md., 1600 tons, bids being taken.

Thirty-nine bridges for Boston & Maine railroad, 2000 tons, bids being taken.

Piers for army supply base, South Brooklyn, 9000 tons, bids being taken.

Bridge for Central railroad of New Jersey across Delaware river, at Easton, Pa., 2800 tons, and smaller bridge, 200 tons, bids being taken.

Locomotive repair shop at Rutland, Vt., for Rutland railroad, 300 tons, bids being taken.

Uniform Output Desired

Sheet and Tin Plate Makers Consider Plans to Adjust Production to Steel Supply—75 Per Cent Operations Proposed

Youngstown, O., July 3.—Makers of sheets and tin plate met here Tuesday at the call of the National Association of Sheet & Tin Plate Manufacturers, to discuss the best method of keeping the output of their mills at 75 per cent to conform to the reduced supply of sheet bars. Some makers believe it best to operate their mills to capacity part of the time, while others contend it would be better to run only a few units continually. No decision, however, was reached. The general opinion of those present was that sheetmakers buying steel should be supplied with sheet bars so far as conditions permit. Most of the sheet mills here will go down over July 4 for extensive repairs. Some mills have been idle since Monday. Most makers welcome this lull as their mills have been turning steadily for a year and are badly in need of a general overhauling. Besides it will give them a chance to get a fair supply of sheet bars ahead. The sheet bar situation has been extremely critical here the past few months and as a result, sheetmakers have only been working to capacitiy, three or four days a week. The situation has not improved to any considerable extent nor do sheetmakers look for it to do so soon. The leading maker of sheet bars announces that in the face of his present bessemer ingot shortage caused by relining of blast furnace capacity, he is compelled to cut his production of sheet bars 50 per cent. This will have a noticeable effect on sheet production here as many mills depend upon this source for their steel.

Pittsburgh Meeting Also Held

Pittsburgh, July 2.—No policy has been outlined with regard to the equitable distribution of sheet bar tonnages among sheet mills. President W. S. Horner, of the National Association of Sheet and Tin Plate Manufacturers, called a meeting in this city last Tuesday of sheet and sheet bar manufacturers when plans were discussed for uniform allotments of sheet bar tonnages, the idea being to increase the sheet output to 75 per cent of capacity. It is understood that J. Leonard Replogle, director of steel supplies of the war industries board, had authorized manufacturers to arrange for the distribution of sheet bar tonnages. Not over 50 per cent of the sheet bar capacity was represented at the meeting, however, and it is reported that some manufacturers were not favorable to the pooling idea and in consequence nothing was done regarding it. Demand for sheets for essential purposes exceeds the supply and the mills are considering plans to get greater tonnages of sheet bars. Consumers not on the preference list are receiving practically no shipments but most of them are said to have stocks on hand sufficient to take care of their immediate requirements. It is probable that they will be unable to get even a sizable portion of tonnages for future needs.

Italy to Get Ship Plates

Corporation Mills Will Supply 50,000 Tons—Japanese Plates Now Going Through—June Mill Tonnage Record Breaking

Philadelphia, July 2.—An allocation of 50,000 tons of ship plates for shipment to Italy has been made by the government to Steel corporation mills. The Atlantic Refining Co. is in the market for several hundred tons of plates for storage tanks for the Hog Island shipyard. Eastern mills now have enough government tonnage on their books to occupy them variously from Oct. 1 to the end of the year.

Turning Out Heavy Tonnages

Pittsburgh, July 2.—Plate mills are operating at capacity and production is said to have reached a point where ship steel is being piled at shipyards. Tonnages also are moving in good volume to car builders to be used in constructing the 100,000 cars recently distributed by the railroad administration. Total plate production for June, with 25 working days, made by the Carnegie Steel Co., was 116,417 tons as compared with 125,480 tons, made in May, with 27 working days. The 110-inch Liberty mill at the Homestead works produced 18,433 tons in June as against 20,973 tons in May.

British Want Plates

Youngstown, O., July 3.—Large tonnages of plates are wanted by the British in addition to those already being rolled by the mills here. The latter at present are in a position to take on further plate tonnages, but certain complications are holding up the placing of any foreign bookings for this material. It is expected that before long an agreement will be reached whereby the mills will be permitted to satisfy the British needs.

June Tonnage

Cleveland, July 2.—A record-breaking tonnage in plates and also of shapes was entered for rolling in June by leading producers. This is due to the large orders for ship and car steel which recently have been widely distributed. Many orders for material from manufacturers of car specialties or supplies are now reaching the mills. The Carnegie Steel Co. will receive 5000 tons of boiler plates for the 60 additional vessels which the American Shipbuilding Co. will build for the Emergency Fleet corporation.

Roll Japanese Plates

Chicago, July 2.—The leading independent steelmaker will be busy practically through July on its sheared plate mill rolling material to apply on its contract for plates to be exported to Japan. When this tonnage was released by the war industries board it was given preference over all other material as it forms the quickest method of obtaining additional ships. The understanding is that immediately on receipt of plates at the Pacific port from which they are to be exported, the Japanese government turns over completed ships for an equivalent tonnage. Thus the ship capacity is obtained without the necessity of waiting construction. Although some statements have been made that shipyards have received sufficient plates to give them a slight reserve, this is not true of Pacific coast shipyards. Some of the latter still are short.

Fluor Spar Active

Pittsburgh, July 2.—Numerous inquiries are out for fluorspar, the average requirement being for 1000 tons. Third quarter and last half shipments are in principal demand. Sellers are quoting $28 to $30, f.o.b. shipping point, for gravel fluorspar, 85 per cent calcium fluoride, washed for these deliveries.

Pig Iron Output Holds High Level

June Production Closely Matches Record Set in May—First Half Shows Heavy Loss From Preceding 6-Month Periods—Fewer Stacks in Operation

BLAST furnaces continue to maintain pig iron production at a high level. The output of coke and anthracite pig iron in June, as shown by figures just compiled, fell off slightly from May, but was well above the record for any month since October, 1916.

Production in June was 3,335,182 tons, against 3,451,884 tons in May, a loss of 116,702 tons. On the basis of average daily production, however, the June record was 111,173 tons, against 111,351 tons in May, a loss of only 178 tons.

For the first half of the year pig iron production is 17,991,886 tons, against 19,097,417 tons in the last half of 1917 and 19,067,559 tons in the first six months of last year. The loss in tonnage so far this year, compared with the preceding six months, is 1,105,531 tons; compared with the first half of 1917, the loss is 1,075,673 tons.

MONTHLY PRODUCTION

	1918	1917	1916
January ...	2,403,227	3,159,839	3,171,878
February ...	2,318,242	2,649,935	3,078,548
March	3,209,996	3,255,813	3,327,630
April	3,273,355	3,328,061	3,225,496
May	3,451,884	3,413,677	3,364,584
June	3,335,182	3,260,234	3,213,818
Total 1st half	17,991,886	19,067,559	19,381,954
July	.....	3,337,442	3,221,127
August	.....	3,238,970	3,197,838
September .	.....	3,140,742	3,208,041
October	.....	3,296,286	3,508,180
November ..	.....	3,198,597	3,317,805
December ..	.....	2,885,380	3,184,178
Total 2d half	.....	19,097,417	19,637,169
Grand total	17,991,886	38,164,976	39,019,123

Steel works or nonmerchant furnaces last month produced 2,474,071 tons against 2,524,759 tons in May, a loss of 50,688 tons. The daily average record showed a gain in the output of nonmerchant iron, the June figure being 82,469 tons against 81,444 tons in May, a gain of 1025 tons.

Merchant furnaces produced in June 811,629 tons against 869,713 tons in May, a loss of 58,084 tons. Their daily average output last month was 27,054 tons against 28,055 tons in May, a loss of 1001 tons.

The number of active stacks declined, 355 being in blast on the last day of June, compared with 360 on May 31.

Ferro production last month was 34,063 tons against 36,358 tons in May, a loss of 2295 tons. Spiegel output in June was 15,419 tons compared with 21,054 tons in May, a loss of 5635 tons.

Higher Price

In Effect on Iron Ore Unloaded After June 30

Cleveland, July 2.—Iron ore unloaded from boats at lower lake ports after midnight, June 30, will take the 45-cent advance, approved by the President. Ore delivered previously goes at the old price. This decision covers a point in dispute last week. Uncertainty had arisen because some consumers had received heavy tonnages on their 1918 contracts while others had received little or nothing.

An increased cost factor which will affect some of the producers is the automatic rise in royalties, in those cases where the royalties are based on the market quotation.

Tentative figures for the June ore movement indicate shipments of 10,000,000 tons last month, bringing the total to July 1, up to 19,000,000 tons against 16,135,135 tons last year.

Freight rates from the various ranges are now clearly outlined. The Mesabi, Vermillon and Cuyuna ranges carry a rate of $1; Menominee and Gogebic ranges, 85 cents; Marquette (Ishpeming district), 65 cents; Marquette range (other districts), 75 cents.

AVERAGE DAILY PRODUCTION

	1918	1917	1916	1915	1914
Jan.	77,523	101,930	102,319	51,323	60,624
Feb.	82,794	94,641	106,157	59,521	67,450
Mar.	103,548	105,026	107,343	66,009	75,534
Apr.	109,112	110,936	107,517	70,484	75,383
May	111,351	110,119	108,535	72,747	67,646
June	111,173	108,675	107,127	78,998	63,486
July	.....	107,659	103,907	82,687	63,075
Aug.	.....	104,483	103,156	89,510	64,403
Sept.	.....	104,691	106,935	94,478	62,757
Oct.	.....	106,332	113,167	100,656	57,007
Nov.	.....	106,620	110,593	101,174	50,042
Dec.	.....	93,077	102,715	103,278	48,236
Av'ge	99,402	104,562	106,610	81,022	62,934

Eastern Ores Not Raised

New York, July 1.—Eastern iron ore prices will not be affected by the advance of 45 cents a ton which today became effective on Lake Superior ore. Unlike the lake producers, who pay the freight rates to upper lake ports, eastern producers pay no freight rates on the ore that they ship. The contracts that they make for the sale of their ore to blast furnaces and puddling mills involve prices f.o.b. the mines. Consequently, the freight rate advances on eastern ore come out of the consumers. All rates on iron ore from Port Henry, Fort Montgomery, Ringwood and other iron vanced 33.6 cents per gross ton to consuming points.

The Valley Mold & Iron Co., Sharpsville, Pa., blew out its Alice stack on June 25 for relining.

The blast furnace of the Colonial Iron Co., Riddlesburg, Pa., which was blown out for relining on May 5, was relighted on June 12.

JUNE PIG IRON

States	No. of stacks.	No. in blast last day of month		Total tonnage made.		——Totals——	
		June	May	Merchant	Non-Merchant	June	May
Pennsylvania	160	138	136	219,043	1,074,213	1,293,256	1,313,187
Ohio	79	70	73	151,319	603,917	755,236	793,239
Alabama	47	31	32	109,338	91,413	200,751	210,933
Virginia	21	13	14	35,998	.....	35,998	40,609
New York	28	24	24	86,344	136,636	222,980	237,020
New Jersey	5	4	5	26,989	.....	26,989	23,424
Illinois	25	24	23	70,091	234,850	304,941	305,347
Colorado	6	3	4				
Indiana	15	15	15	29,003	280,782	309,785	330,114
Maryland	4	3	3				
Wisconsin	6	3	4				
Kentucky	7	5	5				
West Virginia	4	3	3	50,924	26,017	76,941	81,571
Tennessee	17	11	11				
Washington	1	1	1				
Georgia	2	0	0				
Texas	3	0	0				
Minnesota	3	3	3	32,580	26,243	58,823	59,028
Michigan	3	3	3				
Missouri	1	1	1				
Spiegel—All states...						15,419	21,054
Ferro—All states....						34,063	36,358
Total	437	355	360	811,629	2,474,071	3,335,182	3,451,884

Seek to Equalize Pig Iron Costs

Producers Consider Various Methods to Bring Relief to Less Favorably Located Furnaces, Particularly in Tennessee, Virginia and the East—Matter Left in Hands of Pig Iron Committe of Institute

PITTSBURGH, July 2.—Outcome of the meeting of pig-iron makers from all of the producing sections of the country held at the William Penn hotel in this city last Friday is being awaited with deep interest. The meeting, which was attended by approximately 100 manufacturers, was called by H. G. Dalton, chairman of the committee on iron ore, pig iron and lake transportation, to receive the complaints of those producers who contend they should be given relief in the way of readjustments or flat increases in pig iron prices to offset higher costs incurred as the results of advance in freight rates, ore prices, wages, etc. Various suggestions were made, but no specific plans were developed. The several proposals made were submitted to the committee, which will consider them from all angles and then refer the matter to the general committee on steel and steel products of the American Iron and Steel institute. Should the latter committee hold that the question is deserving of sufficiently serious consideration it will be submitted to the war industries board.

Most of those present appeared to be of the opinion that the government authorities will neither agree to a change in prices nor readjustments. The war industries board is said to be strongly opposed to a change, at least until it is given more evidence than has been submitted to it to justify one.

Complaints against the maintenance of existing prices for the third quarter, recently reaffirmed by the government, were confined at the meeting to producers in Tennessee, eastern Pennsylvania and Virginia, with the Tennessee makers voicing the greatest protest. They contend that they are losing money, but failed to state in dollars and cents what their loss is. Eastern Pennsylvania and Virginia furnace interests said that they are placed in an unfavorable position because of the increase in freight rates they have to pay. Some makers from the southern Ohio district also maintain they are deserving of some kind of relief. Lake, valley and Pittsburgh furnacemen had no complaint to make; on the contrary, they said were able to operate profitably.

As far as developments indicated, about 90 per cent of the industry is able to make iron profitably under present conditions. The question, therefore, seems to relate to the matter of providing relief, if any is determined upon, to the remaining 10 per cent. This being the case, it is believed that any readjustment that might be brought about would affect only the smaller percentage, and not the industry as a whole.

Establishing of basing points, flat increases in prices, creation of a zone system and other expedients were suggested by different makers. W. H. Smith, Nashville, Tenn., of the Bon Air Iron & Coal Corp., speaking for the Tennessee Pig Iron association, in his appeal before the committee, said makers in that state were losing money and suggested that a flat increase in prices should be granted. He recognized, however, that establishing of Birmingham, Ala., as a basing point would aid Tennessee furnaces to the extent of about $1 a ton, but this, he said, would not be sufficient to offset the losses Tennessee furnacemen claim to be suffering. Mr. Smith pointed out that the price of coke from Wise county, Virginia, which the Tennessee furnaces use, has been increased $1.25 a ton, and that the freight rate on this commodity has been increased 60 cents a ton. These items, together with an increase of about 100 per cent in wages since last April, were offered as justifying higher prices for Tennessee furnaces.

Small favor was given the suggestion that Pittsburgh be made a basing point for eastern furnaces. Adoption of this plan, however, one member of the committee said, would injure Virginia furnaces, which are complaining, instead of giving them relief because they then would be compelled to sell iron at the Pittsburgh price less the freight rate to their furnaces. Other places also were suggested as basing points, but a number of manufacturers pointed out complications which they said would arise from effecting such a plan under present day conditions. The zone system was declared by some to be objectionable for reasons not unlike those pointed out with regard to establishing basing points. The idea of pooling tonnages was entirely discounted. Another suggestion was that these fur-

Complete New Price Booklet Now Ready

SO MANY changes have been made in the official government schedule of prices of iron and steel and nonferrous products during the past six months that the present booklets presenting this data in collective form have been rendered practically obsolete. Scarcely a major iron and steel product has not undergone in that period some revision or modification as to base prices, differentials, extras or conditions of trade either at the hands of the war industries board or of the American Iron and Steel institute. Many additions have been made to previous schedules so that the entire fabric of government price control has been well rounded out and now stands as a practically finished achievement.

For these reasons THE IRON TRADE REVIEW *believes it is performing a real service to the iron and steel and allied industries by the announcement that it has prepared and now has ready for distribution a new and complete volume covering all phases of up-to-date government regulation. This booklet not only contains all adopted base prices, differentials and extras, applicable for months hence, arranged and classified by product, but it embraces all official announcements and rulings of importance on prices, sales, priorities and general distribution; full directory of price authorities of the war industries board and of the lake trade; comparative open and controlled market prices, charts, etc. Its 75 pages comprise a manual of government regulation, highly valuable for constant reference. A limited edition has been printed and copies are available to subscribers at $1 each.*

naces which are not able to make money be placed on a cost plus plan. Manufacturers having in mind the outcome of this system when applied by the government to different contracting lines criticized the idea vigorously.

War Board Said to be Opposed

Mr. Dalton, who presided, explained the situation at Washington, and informed those present that the war industries board is opposed to increasing prices for pig iron during the third quarter and only reluctantly allowed an advance in the price of ore so that operators could absorb the increased freight rates.

The meeting was spirited at times, but entirely harmonious, and manufacturers praised the government authorities for the able manner in which they are meeting the big problems coming before them. A vote of confidence in the war industries board was unanimously adopted.

J. Leonard Replogle, director of steel supplies of the war industries board, with his assistant, J. C. McLauchlan, and Leonard Williams, of the steel section of the board, arrived in Pittsburgh while the meeting was in session, but did not attend it. Mr. Replogle said he came to Pittsburgh on personal business matters and his arrival at the time of the meeting was only a coincidence.

He would neither confirm or deny reports that he is going to ask a number of furnaces now making foundry iron to change to the production of steelmaking grades. It is believed, however, that he has such a plan in mind. This opinion is strengthened by the fact Mr. Replogle has stated that there is a big shortage of steelmaking iron, especially basic, and that it will become much greater. He said that the steel requirements of the allies in this country were heavy, France in particular being active in this connection.

Texas Furnace About to Begin Operations

Rusk, Tex., June 28.—The Texas Steel Co., which purchased the iron furnace and foundry here from the state of Texas a few months ago, will soon finish the rehabilitation of the plant and place it in operation. Considerable difficulty was experienced in getting the necessary material for the construction of a hoisting tower and other equipment. Col. L. P. Featherstone, of Beaumont, president of the Texas Steel Co., has been directing the work. In connection with the early completion of this work, it is announced by Colonel Featherstone that the company will soon begin the construction of a large iron and steel plant at Beaumont. An engine house and a laboratory of brick construction have been erected here. The electric plant, the blast furnaces and the coke ovens also have been put in shape.

The water supply will be obtained from two large spring-fed reservoirs, which are connected with the plant by a few miles of line. A standpipe assures a sufficient supply at all times. The mining plant is equipped with three miles of narrowgage railroad tracks and 32 ton cars for handling the ore from the mines to the furnace. The substitution of a steel hoist for the old wooden tower, and the putting in of the Hunt blast-filling system enables four men to do the work in which the state in its operation used 16.

Plan Yard Extensions

A large amount of work is to be done in connection with the merging of the shipbuilding plants of the Skinner & Eddy Corp. and the Seattle Construction & Drydock Co., Seattle. A new dock will be installed in which will be located coppersmith and pipe shops, pattern and joiner shops. Foundations have been started for the plate and angle-bending shed, which will serve two sets of ways and will be 82 x 260 feet. Work is also to start in the near future on an additional foundry and machine shop to be 600 feet long and for one-half its length 150 feet wide and for the balance of the distance 125 feet wide. A similar building is also to be constructed in another portion of the yard to be 500 feet long. Additions to general offices will be 120 x 176 feet. The outlay will be $250,000 to $300,000.

Beginning to Operate

Dayton Coal & Iron Co., Dayton, Tenn., long idle as a result of litigation, which is being rehabilitated under the management of Harrison S. Matthews, is about ready to begin operations on a considerable scale. From one of the mines on the property the company is already getting from 275 to 300 tons of coking coal a day, and soon hopes to increase production to 400 tons or more. Preparations are practically complete for the starting of a battery of 375 coke ovens and the larger of the two blast furnaces of the company is being relined and will be blown in as soon as coke is being produced in sufficient quantities to supply it.

Shortage of Tungsten is Serious, Says Expert

Warning of a serious shortage of tungsten was sounded by J. H. McKenzie, United States bureau of mines, who appeared before the United States tariff commission in San Francisco, June 28. Mr. McKenzie said there is not a supply of tungsten sufficient for the world for one year now in sight. "It is the concensus of opinion of producers that price causes the fluctuation in production," he continued. "An increase of $35 per unit would cause an increase of 50 per cent in production and a decrease in the price to $15 would result in a 50 per cent decrease in production." He added that California and Nevada are relied on to supply the future requirements for tungsten. The ore bodied of Colorado are small and of low grade, while the cost of mining is almost double that in California and Nevada.

The commission was informed by Mr. McKenzie that Great Britain, France and the United States are now negotiating to divide the world's production, a tentative agreement providing that Great Britain retain all the tungsten produced in Burma, the United States all that produced within her borders, the production of other countries being divided between the three nations.

Explains Jobber Control

Members of the National Supply and Machinery Dealers' association are receiving a letter from Secretary-Treasurer T. James Fernley, Philadelphia, in explanation of the newest war industries board's move to regulate replacement of warehouse and hardware stocks. Accompanying the letter, which follows, is a suggested form for monthly reports:

"The association urges its members to bear in mind the dignity and importance of their calling and the fact that they are not seeking to obtain material for their own consumption, but as wholesale distributors they are admittedly performing a most useful service in supplying the vital needs of the country and in thus substantially aiding in the speedy and successful prosecution of the war.

"It is our belief that the government recognizes the necessity of according wholesale distributors a supply of material for distribution to satisfy the far-reaching war needs which, of course, include argiculture and other industries."

An order for 30,000 metal cot beds for the government has been received by the Charles E. Fogg Co., Boston. The company will occupy the Foster & Richardson Bedstead Co.'s plant, which is to be purchased.

Rail Prices

About to be Announced at $55 to $57 —Large Orders Near

Philadelphia, July 2.—Standard rail prices, it is believed, are about to be announced at Washington and the figures may be made public tomorrow. These prices, it is understood, will be $55, mill, on bessemer, and $57, mill, on open hearth. After the rail prices are settled allocations by the government of 1,500,000 to 2,000,000 tons of standard sections for the various roads under its control probably will soon follow.

Further government equipment orders, it is expected, will be placed as soon as the expanded shipbuilding program is arranged for. These further orders will include 100,000 freight cars and additional locomotives. It is understood that an additional order for 49 government locomotives has been placed with the Baldwin Locomotive Works.

Begin Cars Soon

Chicago, July 2.—Although steel mills are overloaded with demands for shipbuilding and other essential purposes, it is believed considerable material for the government's car-building program will be delivered during the present month. The program calls for delivery of the entire tonnage by Oct. 1, and the cars should be completed during December. However, it is not believed this schedule can be met. Some builders have obtained tonnages of steel bars, which they were ordered to buy from their usual sources, by trading plates for bars with mills to whom the tonnage was allocated, since they are able to obtain universal plates from other mills which could not furnish them bars. One Michigan builder obtained about 12,000 tons of bars in this way.

Close Coke Contracts

Pittsburgh, July 3. (By wire.)—Contracting for coke for the fiscal year beginning July 1 has developed on a small scale. One large producer is renewing contracts with regular customers at the government price and with the provision that in case regulation ends before the period of the contract expires, prices of $6 and $7, ovens, are to be paid for furnace and foundry coke, respectively, on tonnages shipped thereafter.

Consider More Prices

Washington, July (By wire).—Fixing the price of coil chain and other commodities is under consideration here today at a conference between the American Iron and Steel institute committee and the war industries board. Fixing of the chain price has been under discussion for some time.

Operates New Furnace

Central Iron & Steel Co., Harrisburg, Pa., now has its No. 6 open-hearth furnace in operation. The company now is sending the entire output of its No. 2 blast furnace to the open hearth as hot metal. This arrangement is expected to enlarge the steel output.

To Place Cast Shells

Washington, July 2.—The first order for cast semisteel shells under the recent adoption of the ordnance department of this class of munition material, will involve 580,000 8-inch and will be placed in the near future. The total estimated needs of this form for the period of the war of all sizes has been roughly placed at 12,000,000, but the belief now is expressed that it may fall considerably short of this.

Will Supply Wheels

Griffin Wheel Co., Chelsea, Mass., is to be called upon to make 20,000 wheels for a portion of the 100,000 freight cars recently ordered by the government for American railroads. The order calls for wheels of various sizes, the general average to be about 600 pounds each. The price quoted is 3c per pound, or at the rate of $18 per wheel, the lot to cost $360,000. The capacity of the plant is about 500 wheels per day.

The Non-Ferrous Metals

Copper Lead Spelter Tin

	*Copper	†Spot Straits, tin	‡Lead, New York basis	Spelter St. Louis basis	§Aluminum	Spot antimony
June 26	23.50	.....	7.90	8.37½	33.00	13.12½
June 27	23.50	.....	7.90	8.50	33.00	13.12½
June 28	23.50	.....	7.90	8.50	33.00	13.12½
July 1	23.50	.....	7.90	8.62½	33.00	13.12½
July 2	23.50	.....	7.90	8.50	33.00	13.12½

*Government fixed maximum price for prime lake, electrolytic and casting copper, in ingots, pigs, slabs, etc., less than carloads, 24.67½c.
†No spot Straits tin offering.
‡Price agreed to by leading interest and independents.
§Government fixed price for 98 to 99 per cent ingot aluminum in 50-ton lots; lots 15 to 50 tons, 33.10c; one to 15 tons, 33.20c.

NEW YORK, July 2.—The metals selling situation has been considerably upset by the advance in freight rates which became effective June 25. Instead of a freight advance of a flat 25 per cent, various rates have been announced. For instance, a flat rate of 35c a hundred pounds on lead and spelter from East St. Louis to New York is named, which is an increase of nearly 100 per cent over the previous rate of 19c.

The metals traffic committee, comprised of representatives of leading smelters of copper, lead and zinc, is meeting at Washington with the railroad administration, this week, to iron out the tangle. Meanwhile, business in spelter and lead is limited, owing to reluctance of producers to sell metal except on a basis of f. o. b. shipping point, while consumers want to buy on a delivered basis.

The lead situation shows little change from last week's report, excepting that producers have advanced their New York price from 7.82½c to 7.90c, leaving their St. Louis price of 7.75c unchanged, due to the freight advance. The government's requirements for July show an increase over previous months.

The spelter market was firm and quiet until today, when it became a little weak. Prices are a little lower than the recent higher levels, with producers quoting 8.50c, East St. Louis, for prompt, and 8.50c to 8.60c for third quarter shipment.

The aluminum price remains fixed at the government figure of 33c for 98 to 99 per cent ingot. None of this metal is offered by outside sellers, the distribution being entirely in the hands of the producer and the government.

The tin market at Singapore last week stiffened about £9, but quotations at London showed little change. In this market prices of Chinese tin eased off slightly, this grade having sold higher than Banca tin, which is of higher quality than Chinese. Chinese No. 1 for July shipment from Hongkong was quoted 87.50c yesterday and today at 88c, while Banca is quoted 88c for June-July shipment from Batavia and 94c enroute overland to Chicago. Chinese was strong today on account of trouble between Holland and the allies, with the probable result that shipments from the Dutch East Indies may be held up again.

The antimony market is dull, with importers asking 11.87½c to 12c, in bond, for June-July shipment from the Far East, and holders in this city asking 13.12½c to 13.25c, duty paid, for spot metal, exwarehouse.

Increases Blast Furnace Capacity

Lackawanna Steel Co. Now Has Its Eighth Stack in Operation—Adhere to Flare-Type Hearth Jacket—Novel Arrangement Used for Large and Small-Bell Counterweights—Numerous Safety Features

BY JOHN D. KNOX

SINCE the beginning of the war many steel companies have enlarged their steel-making facilities in order to meet the growing requirements of the allies and Uncle Sam. This is especially true of the Lackawanna Steel Co., Buffalo, which since 1907 has added a blast furnace, a billet, a merchant and a continuous-bar mill to its steel plant and now has an 8 and 12-inch combination bar mill and a blast furnace under construction. The output of the company's seven blast furnaces was not great enough to supply iron for the steady operation of these new units and more furnaces had to be built. These were erected in line with the other stacks. The first of these new furnaces, known as No. 8, was blown in March 27. No. 9 furnace is now being erected. Two double-strand pig casting machines which will handle the Sunday melt from Nos. 8 and 9 furnaces are also being built. The ground upon which Nos. 8 and 9 furnaces were built was made by filling in Lake Erie. Many thousand ladles of cinder were required in the filling and the work extended over a number of years. Many thousand wooden piles had to be driven before any foundations could be laid. Concrete was used liberally wherever foundations were required. From the top of the piles to the bottom of the brick lining under the hearth, concrete was poured to a depth of 12 feet. The ore dock and stockhouse bins of No. 7 furnace were extended. No. 8 furnace was designed by the company's engineers and a large part of the plate and steel work was fabricated in the Lackawanna Steel Co.'s shops. In designing this furnace many safety factors were taken into consideration. A clay gun automatically operat- was installed to stop the iron notch after the cast; hand rails and toe boards were installed wherever there are elevated runways, and the ditch which carries away the waste water from the bosh cooling system was built on the outside of the furnace columns instead of near the hearth jacket. In the skip-engine house and gas-washer buildings overhead monorails were extended about 6 feet outside the structures. This is an ideal arrangement for whenever any heavy machinery has to be removed from the buildings, it is elevated by means of a monorail chain block, transferred to the outside of the building, and lowered into a railroad car. Little time and few men are required to do this. When No. 9 furnace is completed the gas mains will be connected with those of Nos. 7 and 8 furnaces and the gas used at both boiler plants. The No. 8 stack is 94¼ x 22 feet and has an 18-foot hearth and a 16-foot stock line. The shell and lining rests upon a cast-steel submantle which is bolted together in sections and supported by 10 structural steel columns. The latter are placed in a leaning position toward the furnace, the vertical height being 29 feet. They rest on individual grillages made of 20-inch, 80-pound I-beam sections. The grillages and column bases are amply strengthened by tension bands which encircle them on the outside. Each column is encased in fire brick about 3 feet above the furnace floor. This affords protection in case of a breakout. The hearth which is 18 feet in diameter on the inside and 10½ feet high, is enclosed in a 2½-inch plate jacket of the conical type. The bottom outside diameter of the hearth jacket is 32 feet 3⅝ inches. The top outside diameter is 24 feet, the slope of the jacket, therefore, being 17 degrees. Cooling of the hearth walls is effected by circulating water through several 2½-inch pipes which are 8 feet long and are placed vertically between the hearth jacket and brick.

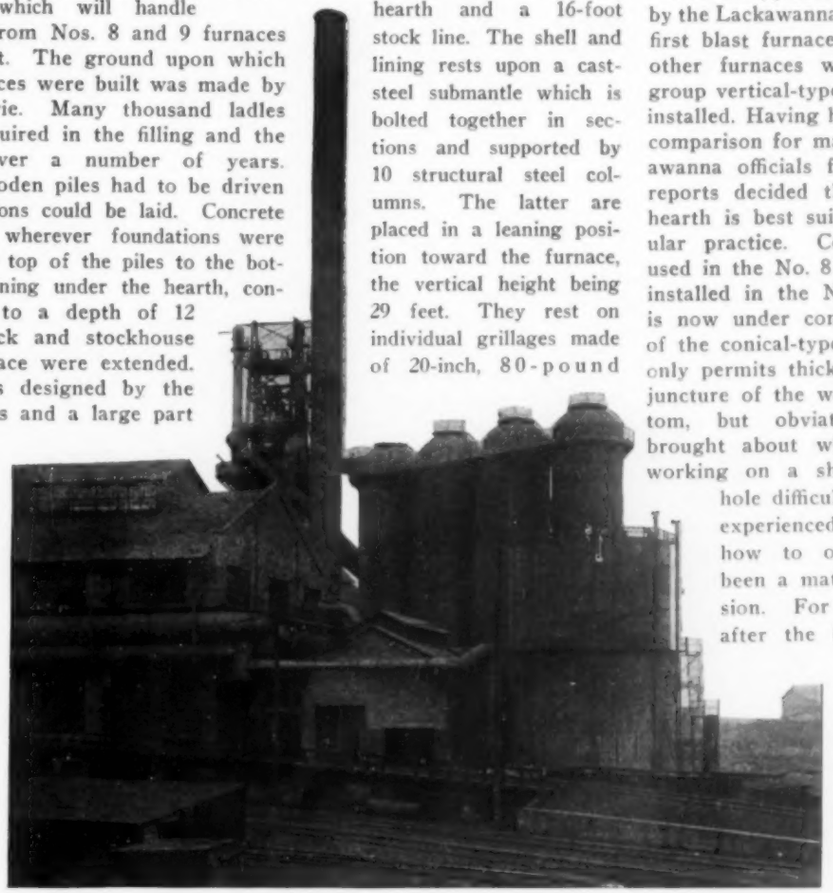


FIG. 1—GASOMETER AND THEISEN WASHER BUILDING. NOTE VENTURIMETER IN GAS MAIN

Conical-type hearth jackets were used by the Lackawanna company when their first blast furnaces were built. When other furnaces were added to their group vertical-type hearth jackets were installed. Having had both types under comparison for many years, the Lackawanna officials from their operating reports decided that the conical-type hearth is best suited for their particular practice. Consequently, it was used in the No. 8 furnace and will be installed in the No. 9 furnace which is now under construction. The use of the conical-type hearth jackets not only permits thicker brickwork at the juncture of the walls and hearth bottom, but obviates the conditions brought about when the furnace is working on a short hole. Tapping hole difficulties have long been experienced by furnacemen, and how to overcome them has been a matter of much discussion. For the first few days after the furnace is in operation the tapping hole retains its original length. But after a few tons of iron have been smelted the hearth walls begin to erode and the length of the iron notch becomes shorter. Further erosion

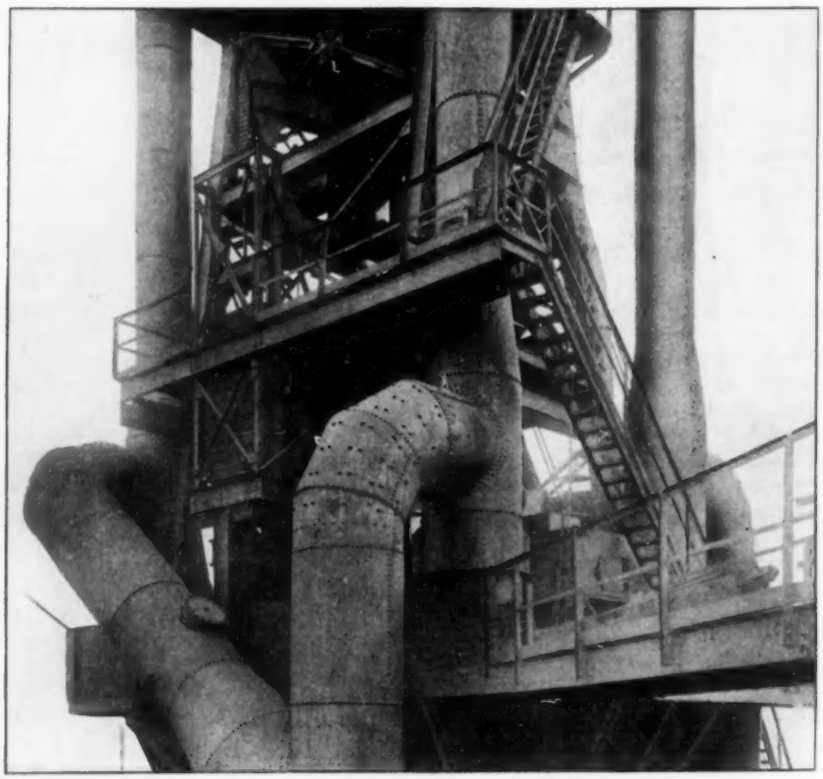


FIG. 2—FURNACE TOP SHOWING ARRANGEMENT OF LARGE AND SMALL BELL COUNTERWEIGHTS

is caused by molten iron as it is forced out of the notch at a high velocity. The slag which begins to issue from the notch during the latter part of the cast also cuts away the hearth brick. Toward the end of the cast when the iron is at its lowest level the gas blows out of the notch and often carries lumps of coke with it. This tends to increase the diameter of the iron notch and causes a short hole. When the latter condition prevails and the furnace is blown too hard, a mess of coke is liable to come out with iron. If there is not enough cinder to carry away the coke, it will pile up in front of the notch sometimes as high as the bustle pipe. To clear this coke away from the notch in order to make room for the clay gun, requires 15 minutes or more and in the meantime the blast is held off the furnace which is not only a detriment to the smooth operation of the furnace, but is poor economy. It is said, however, that furnaces with conical hearth jackets are generally free from conditions which result from short holes.

Bosh Cooling System

Seven steel bands, 2 x 10 inches, incircle the bosh and hold it intact. Nine rows of wedge-shape cooling plates are inserted in the brickwork of the bosh; six rows are placed above, two rows between and one row below the tuyeres. Openings are provided in the tuyere breast for 10 tuyeres and coolers.

Electric lights have been installed around the furnace bosh for the convenience and safety of the furnacemen when changing tuyeres. So often when this work is to be done, the watertender in order to see what he is doing places a lighted torch on the top ledge of the hearth jacket or sets it on the tuyere stock. If the tuyere opening is not stopped back properly with clay when the blowpipe is dropped, the gas leaks through and is likely to cause an explosion. The lighting fixtures are suspended between each column to about the height of the penstocks, the latter of which are held in place by hangers suspended from the main mantle.

Six-inch tuyeres are at present being used. The tuyere breast is reinforced with a cast-steel jacket. Water is supplied to the tuyeres, coolers and bosh plates from manifolds which are placed vertically on the outside of the columns, the water supply being controlled by means of 3-way cocks. On account of the cocks being placed at a reasonable height from the furnace floor, no ladder is required when the watertender shuts or opens them. At many furnaces these supply cocks are located extremely close to the bosh brickwork and as the usual custom in this country is to wash out the cooling system twice a month, the watertender while connecting a high-pressure hose onto the control cock often becomes gassed. The arrangement of the control cocks at this plant, however, is not only a safety factor but a time saver as well, because the cocks are assembled instead of being scattered all over the bosh.

The pressure of the water used for cooling the bosh is kept at 14 pounds or approximately 1 pound less than the blast pressure, so that if a tuyere or plate cracks or burns on the nose, the blast pressure will prevent the water from entering the furnace, thus preventing an off-cast of iron. The water after passing into the tuyeres and coolers is discharged into boxes which are attached to the outside of the furnace columns. By means of this arrangement the watertender, when making his inspection trips around the furnace, can tell instantly whether or not any tuyeres or coolers are leaking without first attaching a hose to the tuyere or plate suspected and turning the discharge water into the ditch. The bosh-plate discharge water is piped to the overhead combination trough and manifold which encircles the furnace just below the mantle. The water from this trough flows through one of six 8-inch pipes into a 15-inch trench-type sewer which in turn discharges into a reservoir near the gas-washer building.

Provide Against Hot Spots

On the outside ledge of the mantle ring a trough is provided with the proper drainage connections. If a hot spot develops on any part of the furnace shell during the blast campaign which would necessitate the continuous use of sprays, this trough will prevent the water from dripping onto the furnace floor. The cast-house roof is made of heavy boiler plate. Around the furnace shell it is built cylindrical shape and forms a ventilator, as shown in Fig. 3, for the bosh gases. At a majority of blast furnaces in this country the bustle pipe is suspended in slings, but a totally different method of suspension is employed at this furnace. The bustle pipe rests in cradles which are bolted to the columns. By means of this arrangement, the walk on top of the bustle pipe is free from suspension straps, which is a great asset to the one who uses the walk frequently.

Two cinder notches are provided on the rear side of the furnace; one is 23 degrees and the other 45 degrees from the center line of the furnace. Special attention was paid to the arrangement of the iron and cinder

troughs, a diagram of which is shown on page 20. The cinder and iron troughs and spouts are not connected in any way to the runners and spouts used to handle the slag at cast time. Usually these runners are connected and the spouts arranged in such a manner that the cinder has to be flushed into one or more of the cars which are intended to be used during the cast. So often the cast is delayed because these full cinder cars have to be replaced with empty ones. However, the arrangement of cinder runners at this plant alleviates any delay such as mentioned.

Plenty of slope is provided for the iron runners with the result that little scrap remains in them after the iron is cast. A Killeen-type skimmer is used for separating the slag from the iron during the cast. After the furnace has been cast the iron notch is stopped back with clay by means of a Brosius-type air-operated gun which is swung into place by means of cables. At many furnaces in this country two furnacemen are required to push against the gun crane while the keeper guides the gun into the notch. Sometimes if the nose of the gun is cold or the clay is a little wet and a small pool of iron lies in a pocket in the iron notch, an explosion will occur when the nose of the gun enters the notch. In this case the three men are exposed to the flying globules of molten iron and are liable to be fatally burned. But by guiding the gun automatically into the iron notch there is no danger of the furnacemen being disabled. The cables which swing and guide the gun into place are connected through sheaves to air cylinders. The latter are installed near the relief-valve control wheel at the north end of the cast house. The dogs which hold the gun in position while clay is being forced into the iron notch are also operated by means of an air cylinder, the control cock being nearby the clay-gun control cock.

Handling Furnace Material

Coke dust, which is used for covering the iron in the ladles, is brought to the cast house in gondola cars. The latter are placed underneath a steel-constructed coke bin, 12 x 15 feet, at the south end of the cast house. Only a few inches intervenes between the bottom of the coke bin and the top of the gondola, so that it is a comparatively easy matter for laborers to shovel the dust from the cars into the bin. Clay for relining the iron runners is hoisted by means of a winch through an opening in the floor at the north end of the cast house. The clay is made in a plastic condition in the basement of the two-story building, the upper story of which is level with the cast-house floor, and contains lockers, tables and sanitary equipment for the furnacemen.

Runway Around Revolving Cylinder

A McKee stock distributor, the operation of which is controlled by the skipman, is installed on top of the furnace. A platform with hand rails and toe boards is provided around the revolving cylinder and is extremely useful when repairs are necessary or the cylinder becomes plugged. The big bell is 12 feet in diameter and is made with a slope of 50 degrees. The bell-operating mechanism is unique. Instead of the weights being directly attached to the end of the bell-lever arms they are suspended on a link chain and operate in guides made of heavy angle iron. The arrangement is shown in Fig. 2. The rod upon which the weights are attached is connected to an oil-operated cylinder. The chain fits into the grooved section of a radius which is securely bolted to the free end of the bell lever arm. By means of this arrangement the weights operate vertically whenever the bell is raised or lowered.

Gas is led from the top of the furnace through four off-takes which carry safety bleeders so designed that immediate relief is given during heavy slips.

The off-takes are connected to four downcomer pipes which converge into two pipes, as shown in Fig. 2. These pipes enter a 32-foot dust catcher. The gas is then led into a secondary dust catcher.

A further cleaning of the gas is accomplished by passing it through a Brassert-Bacon washer which consists of a dry and wet cleaning tower, the former being provided with Z-bars. Water is supplied to the wet washer by a pump which delivers 1800 gallons per minute. The pump was built by the Wilson Snyder Centrifugal Pump Co., Pittsburgh, and is directly connected to a 75-horsepower Westinghouse motor. As was previously mentioned, the waste water from the bosh-cooling system is used. Dust-laden water from this washer is discharged continually into specially constructed hopper cars which are lined with cement and provided with overflow pipes near the top. About once a week the cars are removed and the water allowed to evaporate after which the flue dust is reclaimed for briquetting purposes. The gas after passing through this cleaning station is considered sufficiently clean for use in the stoves and under the boilers. Platforms equipped with handrails

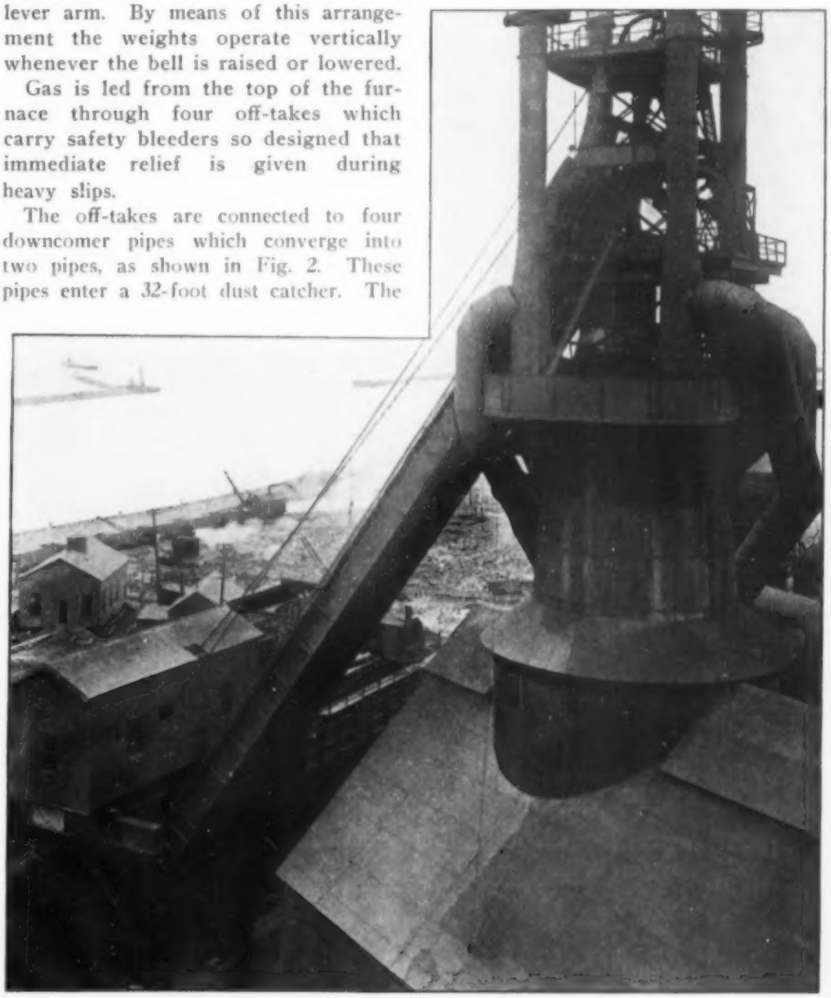
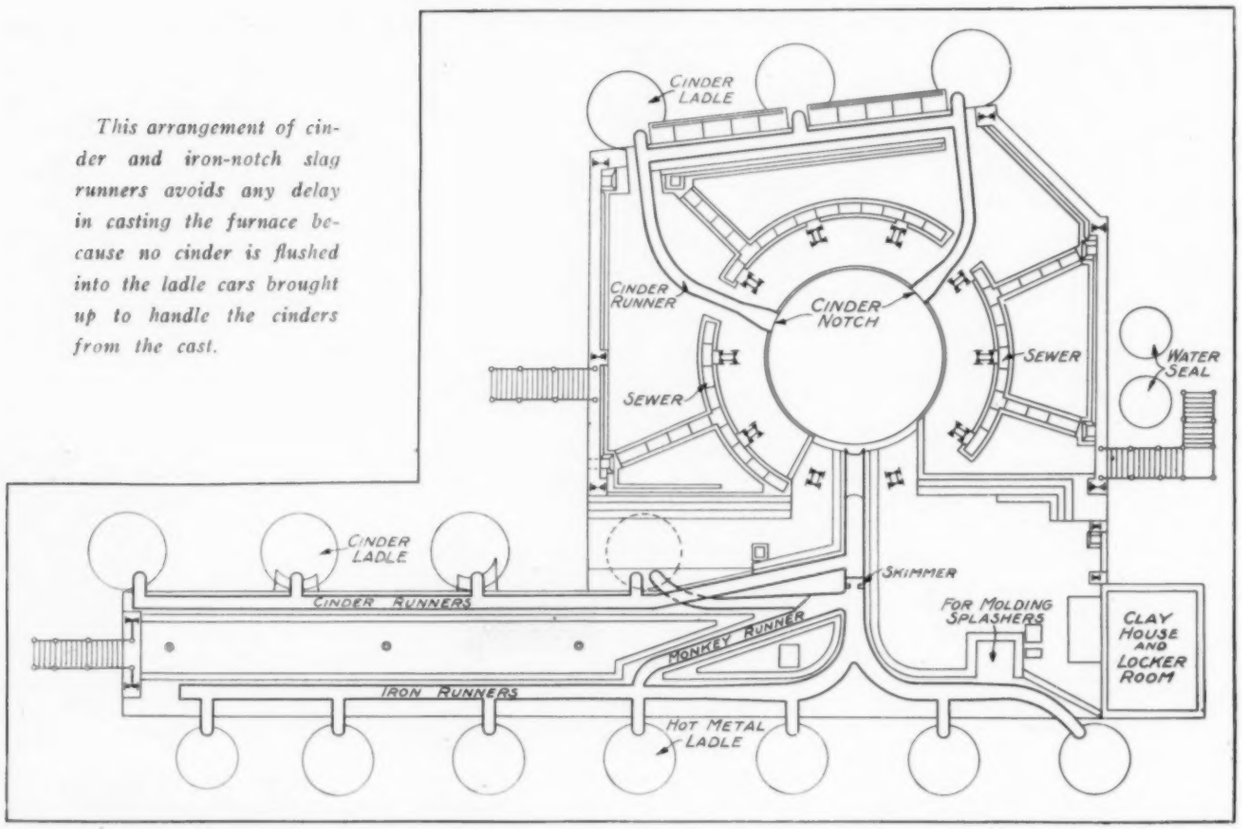


FIG. 3—NOTE THE ABSENCE OF TRUSSES ON UNDERSIDE OF SKIP BRIDGE



This arrangement of cinder and iron-notch slag runners avoids any delay in casting the furnace because no cinder is flushed into the ladle cars brought up to handle the cinders from the cast.

are installed permanently near all valves in the gas mains and are used when bolting the valves in place.

Four stoves, 22 x 110 feet, of the side-combustion type, are provided. They are equipped with 5½-inch checkers. The domes are lined with a special insulating brick. The chimney valves, two of which are provided for each stove, are connected to an overhead flue. The latter leads to a 10 x 228-foot chimney. The blow-off of each stove is also connected to the exhaust-gas flue. Cast-iron wearing plates are provided in the flue at the opposite side to which the hot air enters. The cold blast is by-passed to the hot-blast main through a valve of the Chapman quick-acting type. The gas burners are of a new type designed so they can be turned for easy cleaning. The temperature of the blast entering the furnace, the top heat, etc., are recorded by a Breighlee-type pyrometer which is installed in a brick building at the end of No. 4 stove.

To prevent abrasion, the hot-blast main is lined with the cast-iron bricks at the points where the heated air enters. All elbow turns are also lined with these bricks. The bustle pipe and hot-blast main are insulated with two courses of special brick which was made by the Celite Products Co., New York. A drop valve which opens automatically whenever the blast is taken off the furnace is installed on top of the hot blast main. This takes care of gas which backs up into this main and guards against any explosion.

Protecting Engine Cylinders

It is necessary to eliminate as far as possible any dust particles in the gas whenever the latter is to be used for driving internal combustion engines; otherwise the dust particles would scour the cylinder walls and eventually cause trouble. To obviate this the gas is passed through a Theysen washer. Two washers are provided. These are housed in a 33 x 52-foot building, shown in Fig. 1, north of the blowing engine structure. Each machine is driven by a 150-horsepower motor. Recording gages are installed for successful operation. The gas from these washers is passed into a gasometer which insures a uniform pressure of gas to the blowing engines. The tank shown in Fig. 1 has a holding capacity of 34,000 cubic feet of gas. The bell of the gasometer is 30 feet high, 39 feet in diameter and has a lift of 28 feet. A venturimeter is installed in the main which connects the gasometer with the blowing engines. This is shown in Fig. 1.

Air is supplied to the furnace by two 3000-horsepower, horizontal gas-driven engines which were built by the Mesta Machine Co., Pittsburgh. These are housed in a steel and brick-constructed building, 81 feet wide and 312 feet long. The gas cylinder is 46 inches and the air tub 84 inches in diameter. The stroke is 60 inches. The engine operates normally at 65 revolutions per minute. At present two engines are in operation and a third is being assembled. When the installation is completed the blowing equipment will consist of five engines. These will serve Nos. 8 and 9 furnaces, two engines being required to blow each furnace with the other engine serving as a spare. The flywheel of each engine is equipped with a barring overjack which is operated by compressed air. Two motor-driven air compressors, one of which serves as a spare, supplies air for these jacks at 250 pounds pressure. A 50-ton crane built by the Pawling & Harnischfeger Co., Milwaukee, serves the blowing units.

Two steel-constructed bins, each containing 11 pockets, are placed one on each side of the skip bridge. The coke bin is of ample capacity and is provided with screens at the outlet. A central screening plant is now under construction. Coke dust from this and No. 9 furnace will be conveyed from the outlet of the coke bins to the screening plant where breeze and dirt will be separated. Hoover & Mason 2-truck scale cars equipped with double hoppers transfer the ore and limestone from the

bins to the skip cars. The weight of the material is indicated on a 25,000-pound capacity dial in plain view of the car operator. The skips are of 150 cubic feet capacity and are connected to the skip engine by two 1⅜-inch plow-steel ropes. The skip bridge is anchored at the top by means of a strut and pin connection; it is supported near the bottom by structural columns which also support the skip-engine building, as shown in Fig. 3. Center guard rails and side dogs are provided on the skip bridge. The skips are operated by a hoisting drum which was built by the Otis Elevator Co., New York. The drum is connected through reduction gears to a 150-horsepower motor. A dynamic brake and an automatic stopping device are provided.

A new type of boring tool holder has recently been developed by the Ready Tool Co., Bridgeport, Conn. It was designed for use on vertical turret lathes and boring mills, where a rigid tool holder is essential.

How to Store Your Coals

A LARGE number of inquiries have been received recently by the bureau of mines concerning the spontaneous combustion of coal. In a general statement on the subject the bureau points out that the wisdom of establishing large storage piles must be determined from the facts in each case. The conditions of storage of coal are so various as to make it necessary to apply general principles in each case rather than specific directions.

It is to be recommended that coal should be stored in small quantities as near to the point of consumption as possible. Small coal piles rarely ignite from spontaneous combustion. Coal should be stored near the point of use to avoid rehandling, extra transportation and the degradation of size which follows each rehandling. For these reasons the bureau advocates storage, as far as possible, in the bins and yards of the ultimate consumer, thus dividing the risk of loss from spontaneous combustion.

If large storage piles are necessary, certain general principles must be borne in mind. The generation of heat is the result of slow oxidation of the coal surface. The oxidation is much more rapid from freshly mined coal or from freshly broken surfaces. The oxidation rate increases rapidly with increased temperature. Different coals have different oxidizing rates. These facts lead to the following recommendations:

Where there is choice of coal to be stored, that having the lowest oxidizing rate should be chosen, if known.

Between two coals, that which is least friable and therefore which presents the least total coal surface in the pile, should be selected.

The method of handling should be such as to produce the least freshly broken coal surface.

The coal should be as cool as possible when piled. Piling warm coal on a hot day is more likely to produce spontaneous combustion.

The coal must be kept from any extraneous source of heat.

Alternate wetting and drying of coal during piling is to be avoided if possible.

The fine coal, or slack, which furnishes the larger coal surface in the pile, is the part from which spontaneous combustion is to be expected. Piling of lump coal where possible is therefore desirable.

In the process of handling, if the lump coal can be stored and the fine coal removed and used immediately, the practice prevents spontaneous combustion in coal which would have otherwise given trouble.

Low Sulphur Content is Desirable

The sulphur content of coal is believed by many to play an important role in spontaneous combustion. The evidence on this point is still conflicting, but to play safe, it is desirable to choose coal having a lower sulphur content, when choice is possible.

There is a current belief that dissimilar coals stored in one pile are more liable to spontaneous combustion. The evidence on this point is also conflicting, but to play safe, it is advisable to store only one kind of coal in a pile.

The ground on which a coal pile is built should be dry.

The foregoing recommendations are all derived from the factors affecting the heating of coal.

There should be no spontaneous combustion, whatever the heating rate, provided the heat is carried away as rapidly as produced. Coal piles should be so made that there is ready movement of air for ventilation throughout all parts of the coal pile. This is the condition when the entire pile is made of coarse lump coal. With ordinary coal piling this is difficult.

The surfaces of coal piles should be so exposed as to allow the pile to cool; or else the coal should be so stored that air circulation within the pile is very small. When the air circulation is reduced to a minimum, as in an airtight bin with no opening in the bottom, the oxygen of the air is soon removed and the mass of the coal lies in an inert atmosphere, except for small local circulation near the surface.

Air-tight bins are usually impractical, but the following practice is recommended to approximate these conditions: In making a coal pile of mixed sizes, the coal should be so handled as to make a homogenous pile and prevent the segregation of coarse and fine coal. This frequently determines the most desirable machinery for unloading coal.

It is common practice to limit the height of a coal pile. This is done for two reasons: A pile too high crushes the lower layers of coal, producing more fines; the larger the pile the less heat-dissipating surface there is exposed in proportion to the heat generating capacity of the pile. Twelve feet in height is a common limit.

Whatever precautions are taken in choice and handling of coal, provision should be made for keeping track of the temperature rise in a coal pile and for rapid rehandling of portions of a pile in case of excessive heating. In a coal pile covering a considerable area, it should be so subdivided that in case of spontaneous combustion of a portion, the heat will not be transmitted to the whole pile, thus accelerating the heating of portions of the pile which normally would have remained cool.

To keep track of the temperature of coal piles, it is recommended that ½-inch iron pipe be driven vertically into the pile at distances of 15 or 20 feet apart. A maximum thermometer lowered into the pipe to varying depths will indicate the temperature of the pile opposite the thermometer.

A survey of the pile and a survey of the temperature of all parts of the pile should be made twice a week during the first three months after the pile is made, and once a week thereafter until the pile has evidently ceased to heat. As soon as any portion of the pile reaches a temperature of 150 degrees, provision should be made for removing that portion of the pile. Actual removal need not begin until the temperature has reached 180 degrees, but at these temperatures the rate of oxidation is dangerously rapid. The object of rehandling the coal is to allow it to cool below a dangerous temperature. Any method of rehandling which does not allow of cooling will only transfer the difficulty from the old pile to the new one. It is usually useless to employ water in an attempt to cool a coal pile.

Designs High-Cutting Speed Planer

Machine Described Was Built as a Result of Experiments Conducted to Develop a Planing Tool That Would Operate at Fast-Cutting Speeds by Means of Accelerated Platen Travel

THE planer shown in the accompanying illustration was developed by the Powell Machine Co., Worcester, Mass., with the object of producing a metal planing machine especially adapted to give high cutting speeds by providing for accelerated platen travel after the cutting action is begun.

Those conversant with shop practice know that while on the engine lathe cutting speeds as high as 300 feet per minute can be maintained, the same rule does not hold good with the planer. With the latter tool, the case is different because two troublesome factors must be taken into consideration—the shock caused by the reversal of the platen at the return of the back stroke and the impact of the tool striking the work at high speed. These difficulties have been overcome by the Powell company, it is said, through automatic means which allow the tool to enter the cut at low speed, after which the speed is accelerated.

For example, in connection with the usual driving shaft with a pair of tight and loose pulleys for a return speed of 120 feet per minute, and a pair of tight and loose pulleys for a cutting speed of 60 feet per minute, the planer is equipped with a second driving pulley and connections which increase the speed of the driving shaft to 180 feet per minute.

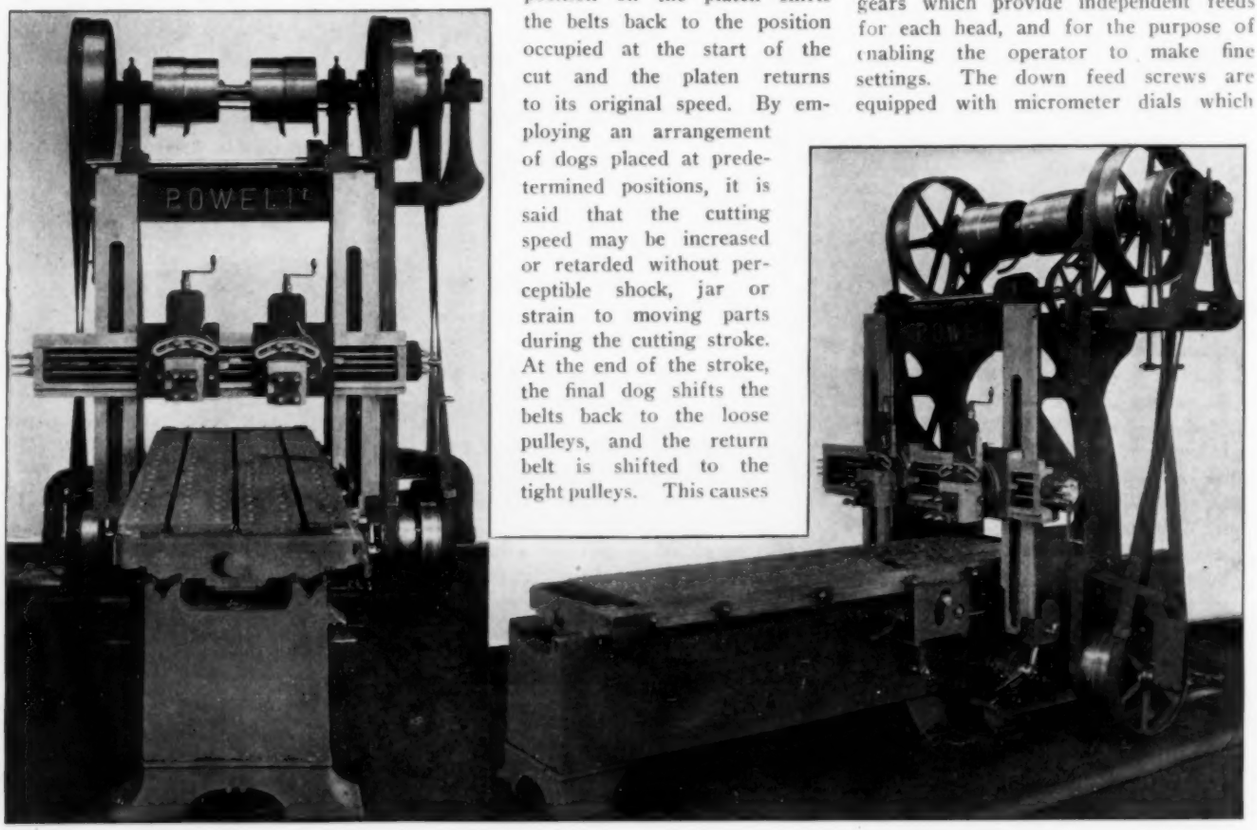
The action is as follows: As the table reverses to take the cutting stroke, the cutting belt is shifted to the tight pulley which is provided with a ratchet. The tool now enters into the cutting stroke. After the platen has moved a predetermined distance, a dog attached to the platen shifts a belt to the secondary high-speed pulley. This increases the speed of the driving shaft which unlocks the ratchet pulley. This pulley now becomes loose, owing to the fact that its speed is less than that of the shaft which is being driven by the high-speed pulley.

The platen is now running at increased speed. This continues until another dog placed at a predetermined position on the platen shifts the belts back to the position occupied at the start of the cut and the platen returns to its original speed. By employing an arrangement of dogs placed at predetermined positions, it is said that the cutting speed may be increased or retarded without perceptible shock, jar or strain to moving parts during the cutting stroke. At the end of the stroke, the final dog shifts the belts back to the loose pulleys, and the return belt is shifted to the tight pulleys. This causes the platen to return at normal speed.

On the accelerating dog, there is a lifting latch which, when in action, strikes a rocker connected with the belt shifting mechanism. This latch can be raised and held clear of the shifting rocker which causes the planer to operate as a one-speed machine.

The illustration shows a 36 x 36-inch planer arranged for belt drive. With this machine, it is said, cast iron can be roughed out and finished at a speed of from 40 to 120 feet per minute, while steel can be planed at a rate of from 30 to 180 feet per minute. The machine shown will take 37 inches between housings and 37 inches under the crossrail. The platen is of the double-deck type which serves to keep chips out of the gearing. The rack gear is steel and the intermediate gears are semisteel. All pinions are nickel steel. All gears are guarded and all movable parts are protected by covers to conform with the safety regulations of the various state codes.

The crossrail is equipped with feed gears which provide independent feeds for each head, and for the purpose of enabling the operator to make fine settings. The down feed screws are equipped with micrometer dials which

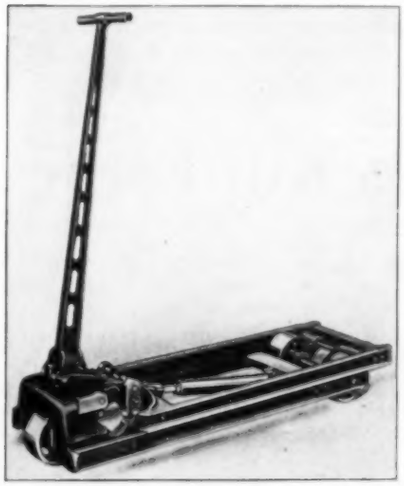


END AND SIDE VIEWS OF A PLANER EQUIPPED WITH AN ACCELERATED SPEED DEVICE

enables the operator to make accurate settings, while engaged on precision work. This tool is furnished either with a direct motor drive or can be driven from a line shaft.

Lifting Truck

The truck shown in the accompanying illustration was recently brought out by the Cowan Truck Co., Holyoke, Mass., and is designed to be operated by one man. It is made in several sizes ranging in capacity from 1000 to 3000 pounds. The truck is fitted with a locking device, the object of which is to safeguard the load from becoming unseated when trucking over uneven floors. The truck is said to be easily operated. It is especially designed for plants having



ONE-MAN LIFTING TRUCK

a large amount of material to move from place to place during manufacturing processes.

Preventing Shop Thefts

Shop pilfering is difficult to detect. If small articles are missed by the workmen, suspicion and distrust, taken with distracted attention incident to the effort to trap the pilferer, often cause a distinct loss in production. Lockers safeguard clothing, but additional security is often needed for small tools, and personal articles kept at the bench. To meet this need a light all steel bench drawer, shown in the accompanying illustration, has been devised. A solid sheet metal top prohibits tampering at the rear, and prevents the contents from wedging. Triple thickness metal around the upper edge and welded joints provide strength and durability. A cylinder lock with two keys is provided, and if desired a master key system is furnished to allow in-

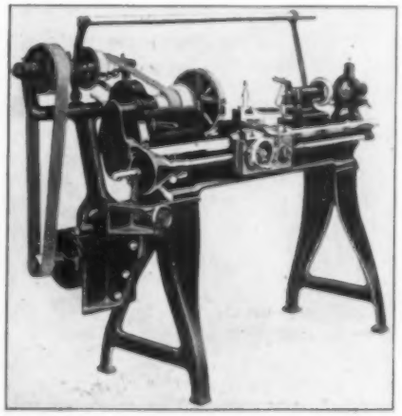
AN ALL STEEL LOCK DRAWER FOR BENCH USE

spection by shop foremen. The latter feature is a safeguard against the storing of contraband by the workmen. The drawer may be installed without cutting the bench. To install the drawer the two stops shown at the back are removed, and the drawer is pulled out from the slideways. The top may then be screwed to the under side of the bench, the drawer slid into place. The stops are then replaced. This drawer is manufactured by the New Britain Machine Co., New Britain, Conn.

Quick-Change Features in Shepard Lathes

Among the new models of screw-cutting lathes recently put on the market by the Shepard Lathe Co., Cincinnati, is one with an all-geared head adapted for use with a semi quick-change attachment, eliminating need for a separate set of gears. This feature is said to possess all the advantages of the complete quick-change lathe.

A lever in the headstock provides means for reversing the feeds without stopping the lathe, shifting the belt or changing the direction of the rotation of the lathe. This mechanism, operated by a clutch, permits the lead-screw nut to remain in constant engagement when changing threads, making it unnecessary for the operator to watch the dial and reverse the belt. A considerable in-

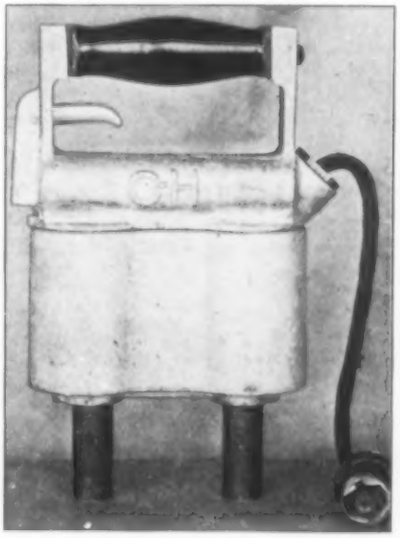


NEW SEMIQUICK-CHANGE, SCREW-CUTTING LATHE WITH SWINGING-ARM SUPPORT FOR COUNTERSHAFT

crease in speed of production is said to be obtained.

The tailstock is of the offset type with an extra-long bearing on the bed and is adapted for turning tapers. The bed, which is deep, is designed for rigidity under heavy strain. The weight of the lathe varies from 800 to 900 pounds according to the length of the bed. The lathe is equipped for various styles of drives.

Another model embracing practically all the foregoing features has a three-step cone head for use with a 2-inch belt. This lathe is provided with a swinging arm supporting the countershaft, which, with the electric motor, is fastened to a bracket bolted to a leg of the lathe. This device puts the lathe and drive in one unit while the additional weight is placed



IMPROVED HAND MAGNET

near the floor. A screw and handwheel movement controls the countershaft arm permitting proper bolt adjustments.

Lathes of both models are made with 10 and 12-inch swing. They are tested to an alignment 0.001 of an inch on a 15-inch bar.

Improved Hand Magnet

Changes in design have been made recently in the hand magnet which has been manufactured by the Cutler-Hammer Mfg. Co., Milwaukee, for the past decade. The magnetic coils, switch and connections now are completely covered by two aluminum castings. The upper casting forms the yoke cover, switch cover and handle supports while the lower casting encloses the coils. This leaves only the soft-iron poles projecting.

The circuit to the coils is closed and opened by means of a large trig-

ger mounted under the handle, which operates a make-and-break switch concealed in the upper cover. The index finger is used to pull the trigger, closing the switch. A slight release does not open the switch but a full release opens it with a quick break.

This magnet has been used by metal dealers, smelters and refiners, iron foundries, machinists, paint manufacturers, chemical works, tinners, electroplaters, plumbing goods manufacturers, shipping departments and in other lines of work. The magnet weighs 8 pounds.

Nonwar Use of Platinum Must Be Stopped

Purchasers of platinum jewelry, or buyers of that commodity for other than war work have been styled "slackers" by the bureau of mines of the department of the interior. To supply the govenment's pressing needs, the war industries board has ordered that 75 per cent of the platinum stocks held by manufacturing jewelers and complete stocks held by refiners, importers and dealers be commandeered. This however will only temporarily supply the lack and the American Chemical Society, composed of 12,000 leading chemists of the country, is co-operating with federal officials in an effort to eliminate entirely the purchase of platinum jewelry, etc. Platinum is necessary in the production of nitric and sulphuric acid, the essential in all explosives; in pyrometer manufacture, since no gun can be made without the use of a pyrometer, in signal instruments and in delicate gun mechanisms. Without it all experiments in gases would be practically impossible and it is required in the new plants erected by the government for the manufacture of nitrates from the air for fertilizers and munitions.

For electrical work the proportion of iridium used with platinum is greater than in the jeweler's alloy. For some work, it may be as high as 50 per cent. A large number of different electrical control systems require platinum in their makeup. One of the most important is the thermocouple for the electrical control of heat in furnaces and ovens for many purposes. Its ductility is one of the elements which make platinum so desirable for industrial work. A single troy ounce of platinum can be stretched into a wire which will extend 1800 miles.

Freyn, Brassert & Co., engineers and contractors, Chicago, have received an order for additional Birkholz-Terbeck burners from the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala. Freyn, Brassert & Co. have in operation or contracted for at blast furnaces and steel plants, including coke oven operations, 639 gas burners.

Designs Heavy-Duty Rolling Mill Lathe

THE National Roll & Foundry Co., Avonmore, Pa., is building an enclosed headstock roll lathe designed for all classes of rolling mill work. This lathe is shown in the accompanying illustration.

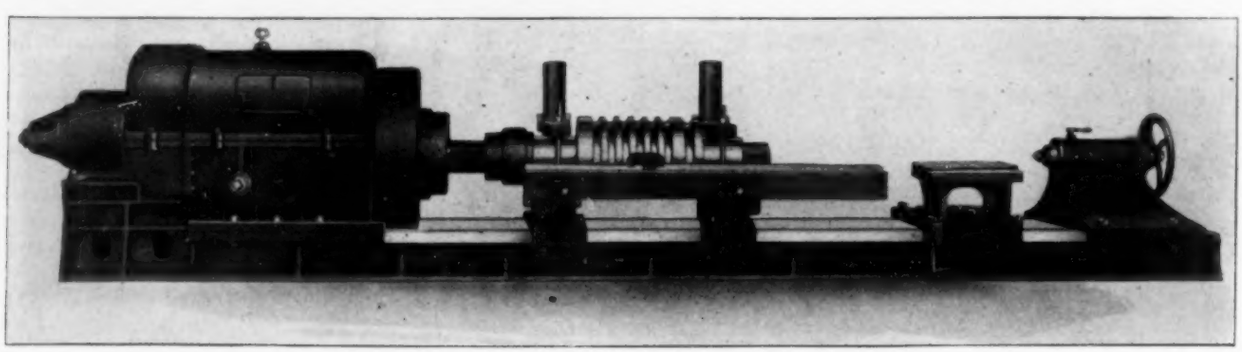
The headstock is entirely enclosed, with the exception of the face plate, in a dust-proof cast iron cover. The gears run in oil continuously. Bearings that are difficult to oil by the splash system are automatically lubricated through a pump that is always in action while the lathe is running. The oil runs back into the reservoir and is used over again as long as the lathe is in action.

The lathe is fitted with a set of transmission gears operated from the outside which give four changes of speed with a constant speed motor. When the lathe is fitted with a variable speed motor, an indefinite number of speed changes graduated to any number of revolutions of the face plate may be obtained. The speed changing transmission device, in addition to the variable speed motor, is designed to take care of cases where no variable speed motor is available. The gears are machine cut and are large enough to transmit power for the heaviest cuts.

The motor is direct connected to the lathe by gearing. It is mounted at the back of the machine on a level with the center of the headstock. It is pointed out that no vibration is apparent. A side door in the gear cover permits the gearing to be readily examined.

The headstock is rigidly bolted to a heavy cast iron bed plate which is extra broad with the object of preventing vibration when taking heavy cuts. The tailstock extends entirely across the lathe bed which gives it a firm setting and enables all hold-down bolts to be on the outside of the bed plate so that bolts only need to be slackened to move either tailstock, necking rest or housings. The necking rest has a flat top overhanging the sides sufficiently to permit the side wedge to be driven up outside of the rest.

The roll housings have a round post at the back. This permits the caps to be swung around without lifting them off and makes it convenient for topping rolls of any description. The caps are held down by a single hold-down bolt and are short enough not to interfere with the piano rest. The bearings are screw adjusted as is also the piano rest. An adjustable bearing directly back of the center of the necks prevents any spring in the roll when the tool is forced in.



ROLL LATHE PROVIDED WITH VARIABLE SPEED DEVICE—ALL GEARING IS SELF-LUBRICATED AND ENCLOSED

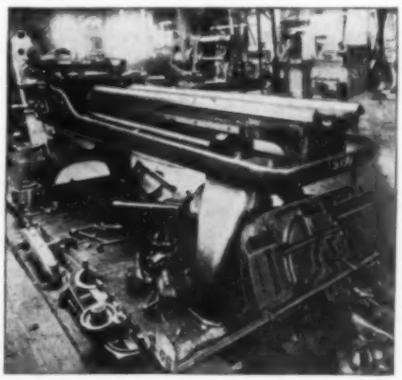
Filling the Gaps in Shop Equipment

Unprecedented Conditions Induced by Top Speed War Production Have Created a Wide Field of Usefulness for the Dealer in Used Machine Tools— How This Responsibility Has Been Met

BY B. K. PRICE

NOT LONG ago, Col. H. W. Reed, of the ordnance department, addressing machine tool builders assembled in convention at Atlantic City, stated that the government needed at the very minimum for work now at hand, $15,000,000 worth of machine tools and that it knew where to place hands on only $1,500,000. Thus in terms of figures is the present great shortage of machine tools indicated. Since that time the government has issued its sweeping mandate that all industry must divert its production into channels of essential war work. While many had already taken action in that direction, the majority of manufacturers of non-war products had waited, many because they knew not where to turn, and more, perhaps because they were hopeful that such action would not be necessary. But, the time arrived, even more swiftly than many of the most far-sighted had believed, and today there are hundreds of manufacturers throughout the country who are confronted with the task of making immediate changes to engage in other work. Their alternative is to lose their organization and all that goes with it.

With this large gap between supply and demand the dealer in used machinery has come into a position of importance never before known in the history of the machine tool industry. To him not only falls the lot of bringing to light tools which otherwise might be lost in obscurity, and the handling of large lots of tools released by manufacturers upon the expiration of certain contracts, but also that most important reclamation of such tools for immediate shipment back into industry. His function in thus conserving machine tools and his service as a procurement agent is being observed with rapidly growing appreciation.

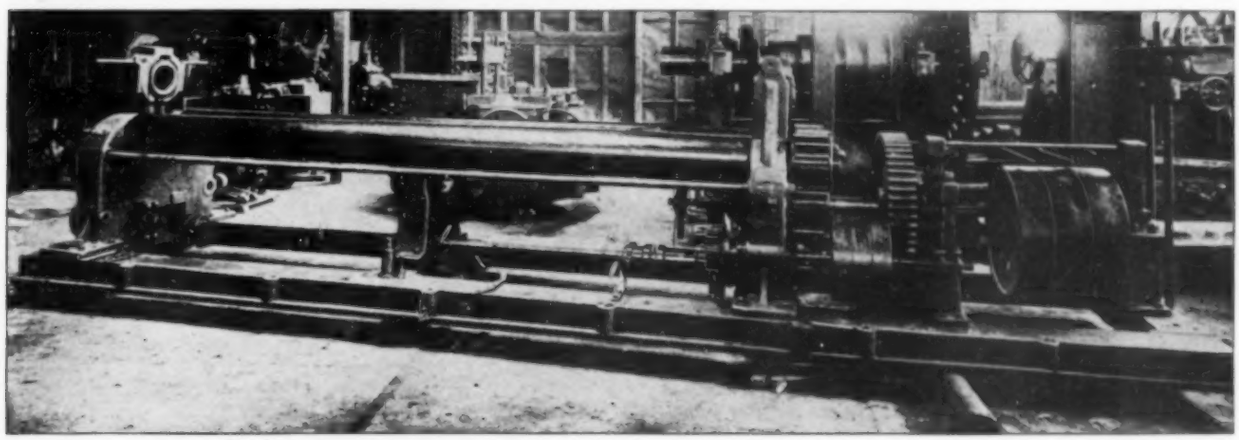


WHAT WAS AND WILL BE AGAIN A JONES & LAMSON LATHE AFTER COMPLETE REBUILDING

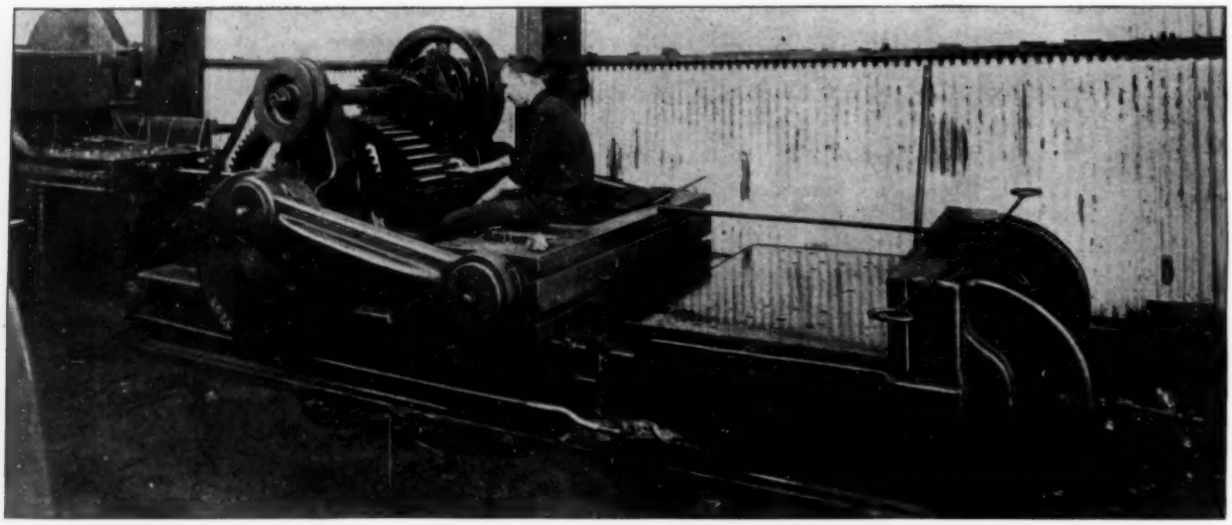
As a result this particularly important part in the war, and the growth and development during the past three or four years the used machinery trade has become of national importance. When war broke out in the summer of 1914, there were but few rebuilders of machine tools. Business in second-hand equipment was confined almost entirely to buying and selling. Demand for the most part came from the small manufacturer, who perhaps lacked sufficient capital to buy new equipment, or from companies wishing to engage in certain work temporarily.

However, when the allies started to buy machine tools in the early part of 1915 and the manufacturers in this country began taking on munition contracts in rapidly increasing volume, the demand for used equipment underwent a change. Deliveries on new tools had been advanced swiftly until with many types it was practically impossible to get shipments under six and eight months and in some instances, those of the large engineering machines, 18 months. But manufacturers had large contracts, for which there were almost without exception limited time restrictions. They needed tools and needed them quickly, so they turned to the dealers in second-hand equipment for aid in supplying their wants. Used tool dealers met the demand for deliveries and further built a place for themselves by taking up the burdens of tool conservation and reclamation. They made for themselves a vital place in America's vast war program.

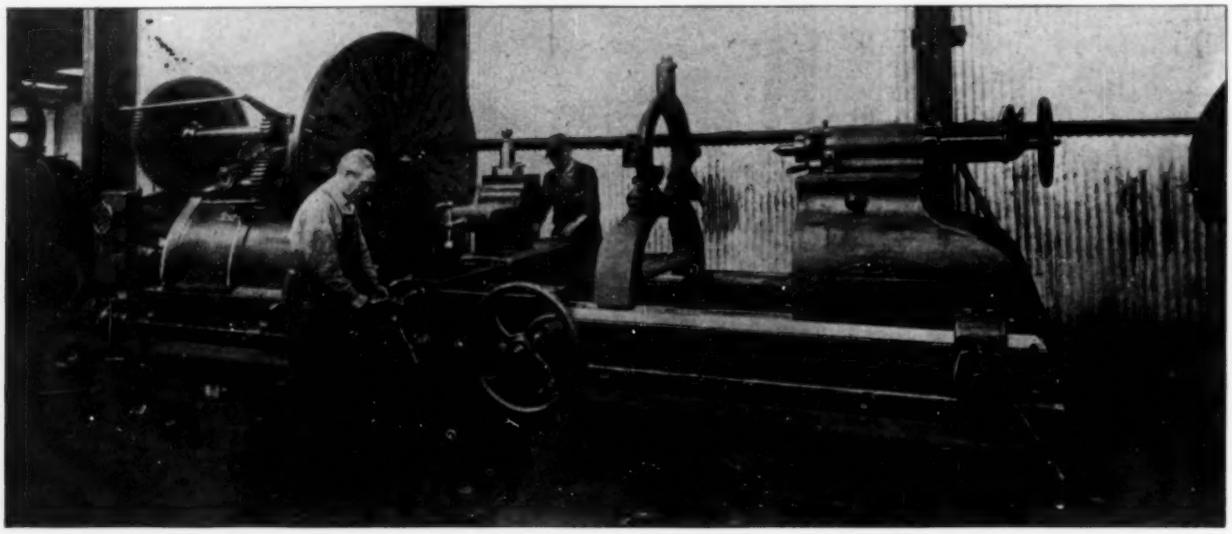
As a natural accompaniment to unprecedented demand, prices soared.



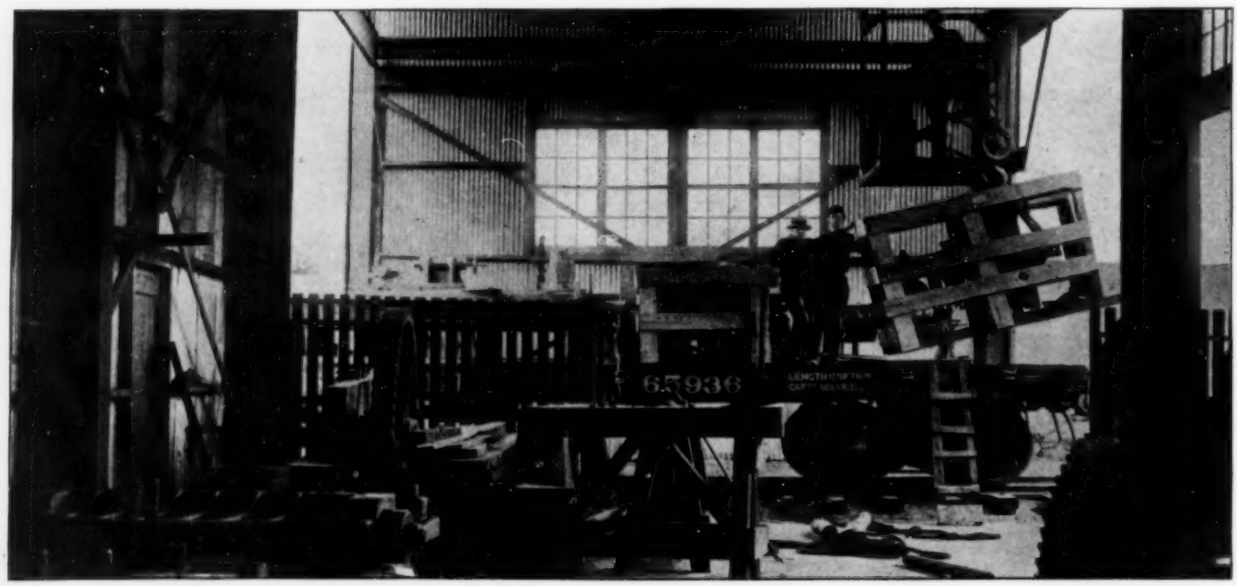
HEAVY BENDING ROLLS ARE NOT PROOF AGAINST THE WEAR OF CONTINUOUS HIGH SPEED OPERATION—WITH DELIVERIES MONTHS OFF, THE REBUILDING OF THIS MACHINE BY THE NEW YORK MACHINERY EXCHANGE WILL BE A REAL SERVICE



FORGING AND BENDING MACHINERY IS BECOMING SCARCE—THE AJAX BULLDOZER SHOWN HERE WILL NO DOUBT FIND SERVICE SOON—THIS IS AN EXAMPLE OF THE GOOD BARGAINS PROVIDED BY THE RECLAMATION SERVICE



EVEN OLD MODEL MACHINES AFTER WORKING OVER BECOME VALUABLE FACTORS IN PRODUCTION—THIS LATHE HAS SERVED SEVERAL HARD MONTHS IN A MUNITION PLANT PREVIOUS TO BEING SENT TO THE TOOL HOSPITAL



EVERY CONCEIVABLE FORM OF LOCOMOTION IS CALLED UPON TO RUSH MACHINE TOOLS TO THE PLANTS WHEN THEY ARE READY FOR SERVICE—SOME RIDE IN PAMPERED STYLE BY EXPRESS—OTHERS MUST RIDE THE FLATS

In many instances, tools after having seen service for a decade, were reclaimed and sold for several hundred dollars higher than the machines cost, new. During the past year, however, prices on machine tools generally have been for the most part relatively steady. In fact, it has only been during the past few weeks, under pressure of rapidly advancing operation costs, that quotations again displayed any marked tendency upward.

In response to the heavy demand for the immediate shipment of serviceable tools, sellers of new, as well as second-hand machinery turned their attention to the reclaiming of used equipment. Warehouses were expanded and new ones established, completely equipped for repairing machines, and new and larger organizations were effected. Scouts were sent out in larger numbers than ever before, picking up odd tools throughout the country. It occurred frequently during those days that the entire machine shop equipment of a munition plant could be picked up, manufacturers in many instances finding it to their advantage to discard tools after several months of hard wear rather than take the time required for extensive repairs. However, the urgent need for conservation has caused manufacturers to change this policy and today every effort is being made to repair machine tools at the plant, or else turn them in for rebuilt machines.

Sources of Supply

The companies now offering large lots of machines for sale are chiefly those whose contracts on certain kinds of work have expired. Perhaps one of the earliest and most notable instances of this sort is that of the Baldwin Locomotive Works, which placed more than 800 lathes upon the market as a result of a change in the variety of its work. There are also a number of companies, formerly engaged in nonwar work, who are now closing down their plants and are selling their equipment rather than allow it to remain idle over a series of months. Further, there are companies who now are receiving new equipment ordered possibly many months ago and these too are placing tools upon the market.

It is obvious that the used machinery trade has become a clearing house for the entire machine tool industry. It forms a medium through which tools upon the expiration of their usefulness to one company can be directed with the utmost efficiency and dispatched into other channels of service. Not only is the used tool market a big factor in keeping up present production, but it is the salvation to many who now for the first time are starting war work.

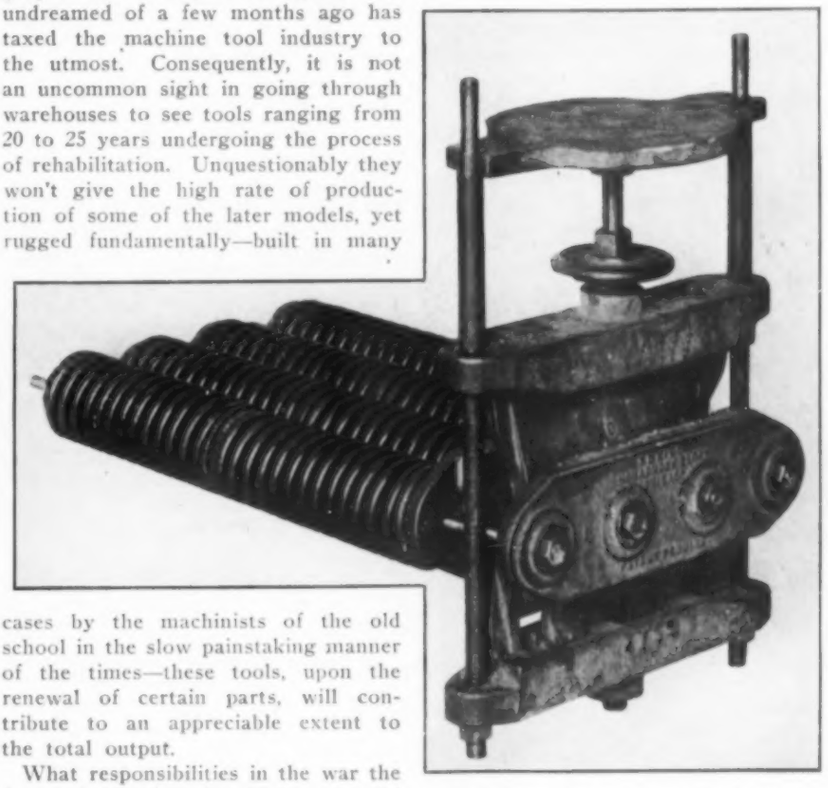
The government in some instances acts as a medium in the redistribution of used machinery, directly from one plant to another. However, only those machines which are in most perfect repair are usually considered. It is in the warehouses that the influence of the government is most strongly felt, as virtually all sales are subject to priority certificates. Despite the efficiency upon which the system of reclaiming tools is operated, the ever increasing scope of the country's war preparations along lines practically undreamed of a few months ago has taxed the machine tool industry to the utmost. Consequently, it is not an uncommon sight in going through warehouses to see tools ranging from 20 to 25 years undergoing the process of rehabilitation. Unquestionably they won't give the high rate of production of some of the later models, yet rugged fundamentally—built in many cases by the machinists of the old school in the slow painstaking manner of the times—these tools, upon the renewal of certain parts, will contribute to an appreciable extent to the total output.

What responsibilities in the war the future holds for the dealer of used machinery is indicated by what has gone before. Through the widening of the scope of his work he has entrenched himself so deeply in the activities of the machine tool industry, that when peace is made he will continue a factor of undiminished importance. For when the rehabilitation of Europe is undertaken and commercial trading is resumed throughout the world, there still will be the large gap between supply and demand for several years to follow.

Punch Press Attachment

The device shown in the accompanying illustration was developed by R. D. King, Chicago, for providing an equal pressure for the entire stroke of a power press when used for metal drawing operations. The attachment is designed to meet the condition under which wrinkles form on drawn work at the beginning of the stroke when the full and maximum pressure is required, while breakage usually occurs at the end of the stroke, being generally caused by the draw ring holding back too hard on the metal.

Increasing, steady or decreasing pressure from 600 to 10,000 pounds is provided for, the length of stroke being 5 inches. If the springs are compressed less than 4 inches at the beginning of the stroke, the pressure will increase during the stroke; compressed 4 inches the pressure throughout the stroke will be equal; compressed more than 4 inches, the pressure will decrease.



PRESSURE TOGGLE FOR DRAWING PRESSES

The pressure on the draw ring is from 3.8 to 0.8 times as much as that on the springs, as the leverage on the toggle is calculated to overcome the increasing resistance of the springs. The pressure toggle is attached to the bolster plate with two rods placed 11 or 18 inches apart as required. The pressure toggle remains stationary and the plate supporting the draw ring pins is moved up and down for adjustment by means of a hand wheel and afterward fastened with a lock nut. A press may be used for ordinary blanking or other push work without removing the device.

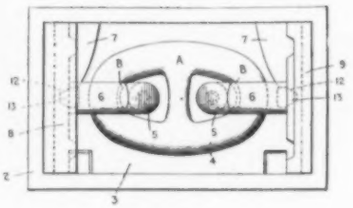


FIG. 1

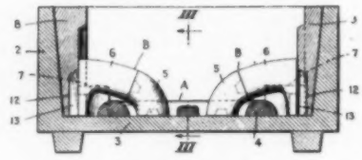


FIG. 2

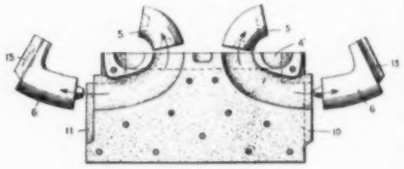


FIG. 3

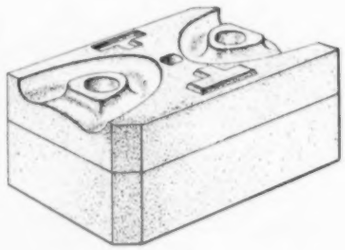


FIG. 4

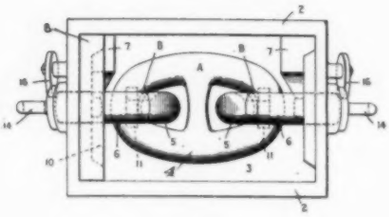


FIG. 5

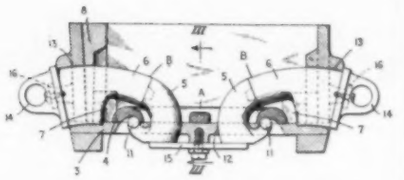


FIG. 6

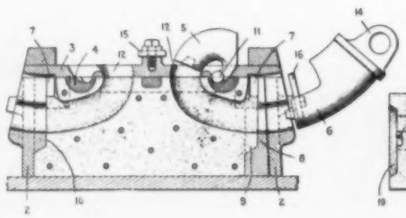


FIG. 7

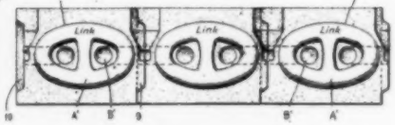


FIG. 8

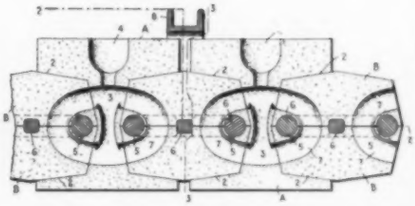


FIG. 9

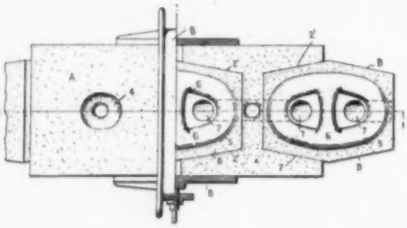


FIG. 10

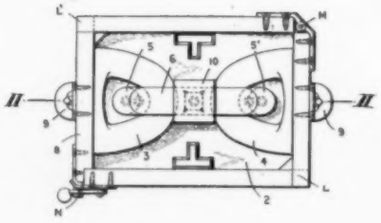


FIG. 11

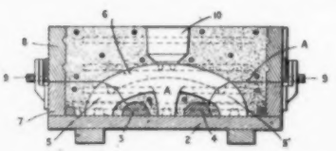


FIG. 12

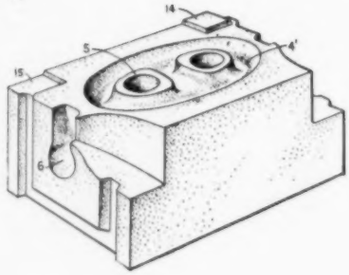


FIG. 13

FIG. 14

HOW THE METHOD OF MAKING CAST STEEL ANCHOR CHAINS WAS DEVELOPED

Figs. 1, 2, 3 and 4—The first method of making the molds. Figs. 5, 6, 7 and 8—The second method. Figs. 9 and 10—The third method. Figs. 11, 12, 13 and 14—The fourth method

How Cast Steel Chains Are Made

Continuous and Pre-cast Link Processes Are Described Before American Society for Testing Materials—Methods of Making Dynamic and Static Tests and Results Also Explained

BY CHESTER K. BROOKS
Assistant to President, National Malleable Castings Co.

SEVERAL months ago, when the National Malleable Castings Co. was invited to participate in the experimental development of cast steel chain, the first problem which required attention was the working out of suitable foundry methods for producing chain links in sand molds, and uniting them into continuous lengths of chain. A number of entirely successful equipments for making the molds was the result, four of which are shown in Figs. 1 to 14.

Connecting up the links into chain was accomplished in either of two ways, the continuous process, in which the entire chain is poured from one heat, into previously prepared and united molds, by filling one interlinked mold impression after another, and the precast link process, in which half the links comprising a complete length of chain are cast separately, shaken out, cleaned, inspected, and made ready for incorporation into the finished chain. Subsequently, the latter links are placed in mold cavities and coupled up into continuous chain by pouring metal into other molds containing impressions for similar links, interlinked with the precast links. Any of the illustrated methods of making molds is equally applicable to the continuous process or the precast link process.

Another part of the foundry problem was the character of the mold. Recognizing the vital importance of sound castings in a product of this character, we came to the conclusion quite early in our experiments that all of the links should be produced in dry sand molds. The methods of application of gates and risers have also required some study and we have been able to obtain excellent results both in pouring through the stud and through the side of the link.

In our preparations for manufacture, the adaptation of the method of heat treatment used for our car-coupler knuckles to 90-foot shots of chain has involved some problems, but these have been solved and the process will be practically identical in method and results.

How Tests Were Conducted

Referring the results of physical tests on cast steel stud chain, we felt that the testing facilities at our Sharon, Pa., steel castings plant, used principally in the manufacture of car couplers, were well suited for the carrying out of further tests which seemed desirable after the last experiments at Schenectady. Our suggestion having been accepted, we made plans to have ready as many different sizes of cast chain as possible in the short time available, and succeeded in preparing short lengths of 1⅜, 2, 2¼ and 2⅞-inch cast steel chain, ready for test March 1 and 2, at our Sharon plant.

The tests were conducted on a vertical screw-type static testing machine of 1,000,000-pound capacity and a standard master car builders' drop-testing machine. The chains subjected to static tension tests were supported by coupling each end link of the test chain to the cross head of the static testing machine by means of a testing shackle and pin as shown in Fig. 15.

Test chains consisting of five common stud links were subjected to a light load sufficient to reduce high bearing spots between adjacent links, which was then released and a measurement over the three middle links laid off. The elongation over this measurement was then taken at load corre-

From a paper presented at the annual meeting of the American Society for Testing Materials, Atlantic City, June 25-28.

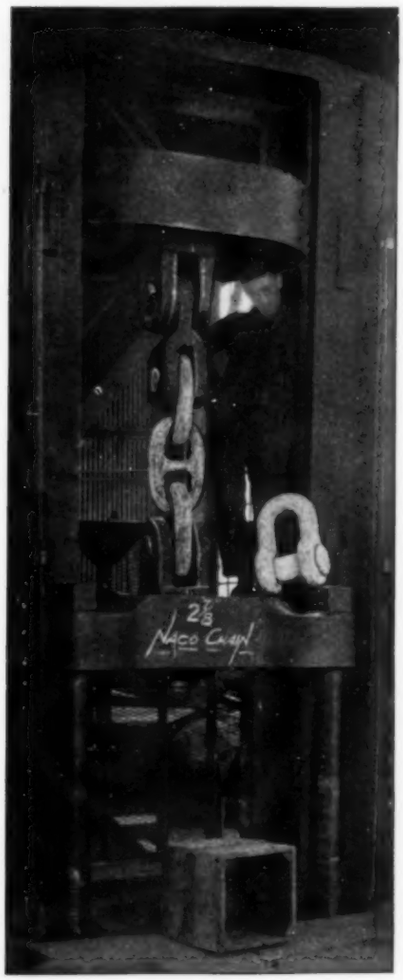


FIG. 15—STATIC TENSION TESTING MACHINE.

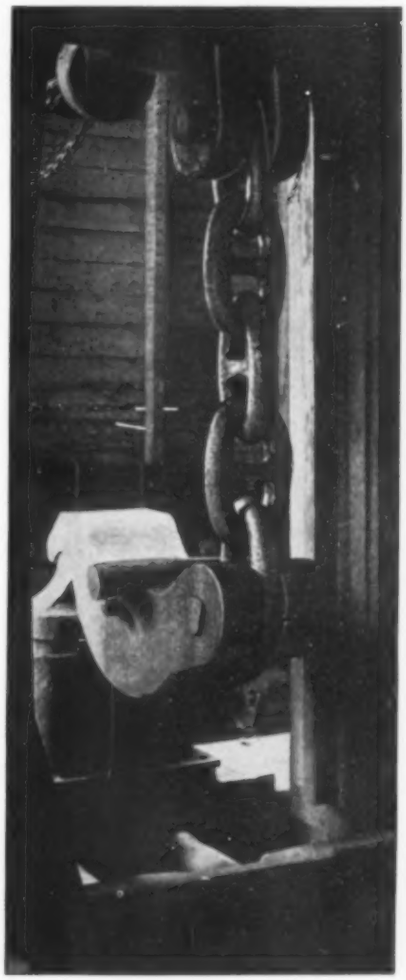


FIG. 16—MACHINE FOR DYNAMIC TENSION TEST.

sponding to the proof load, the breaking load, and the breaking load plus 40 per cent, as specified by the ship classification societies for the corresponding sizes of wrought chain. After these three loads had been applied, released, and elongation measured, a load to destruction was then applied.

Dynamic Tests Made

The test chains used in the drop testing machine, were all of the 2-inch size and consisted of five stud links each. These chains were installed in the testing machine by connecting the upper link in a shackle bar and the lower link in an equalizer shackle by means of shackle pins passing through the eye of each link. This arrangement, which is shown in Fig. 16, is such that a part of the energy of the falling weight is transmitted to the test chain as a dynamic tensile stress. The overall measurement of the middle three links of these test chain was laid off as in the static tests and the elongation measured after the third blow from each of the specified heights. The weight of the tup was 1640 pounds and this weight was allowed to rest upon the equalizer when readings were laid out and elongation measured. In all these tests the numbering of the links was upward, commencing with the bottom link as No. 1.

Table I shows the results of all the static tension tests and Table II the results of the dynamic tension tests. Included among the dynamic tests are not only the tests of 2-inch National Malleable Castings Co. steel chain, but also certain tests on the same size specimens of commercial wrought-iron chain, and samples from the Boston navy yard. Figs. 17, 18 and 19 are photographic reproductions of the various chains used in the foregoing tests. The following details of the tests are of especial interest:

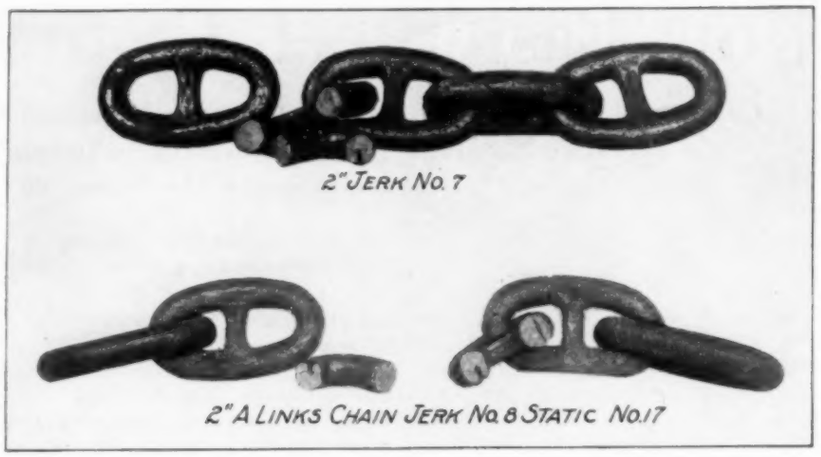


FIG. 17—CAST-STEEL ANCHOR CHAIN AFTER BEING SUBJECTED TO TREMENDOUS JERKS AND PULLS

Results of Dynamic Tests

In dynamic test No. 4 on 2-inch Naco steel chain, the chain was subjected to three blows at 5 feet, three at 10 feet, three at 15 feet, three at 20 feet, 50 at 25 feet and 20 at 30 feet. The chain showed no signs of failure after this severe treatment, and the elongation over the links measured 0.65 inch. This chain was then transferred from the drop to the static machine and subjected to the proof load, breaking load and breaking load plus 40 per cent, after which the load was increased to 452,700 pounds, when the No. 2 link broke, showing solid sections at the fracture.

In dynamic test No. 8 on 2-inch Naco steel chain, the chain was subjected to three blows at 5 feet, three at 10 feet, three at 15 feet, three at 20 feet, 10 at 25 feet, 10 at 30 feet and 10 at 35 feet. The elongation over three links was 0.72 inch with no signs of fracture, after which the chain was submitted to the same static loads as test No. 4 and broke through No. 3 link at 467,400 pounds, showing solid metal at the fracture but with a small shrink at one side.

In dynamic test No. 6 on 2-inch navy chain the chain was subjected to three blows at 5 feet, three at 10 feet, three at 15 feet, three at 20 feet, 10 at 25 feet and two at 30 feet.

The test was discontinued at this point because of excessive elongation in the chain, which permitted the equalizer to interfere with its support and made it impossible to deliver the full blow to the chain. The elongation over three links was 3.85 inches, and each of the five links was slightly fractured in one or more places. After the third blow at 20 feet the elongation over three links was 1.32 inches and after the third blow at 25 feet it was 2.08 inches. Undoubtedly this chain was out of commission on account of distortion so far as serviceability is concerned after the third blow at 25 feet.

Results of Static Tests

Static tests Nos. 13 and 14 on 2¼-inch Naco chain were made on test specimens having serious shrinkages on one side of the No. 3 link opposite the stud, for the purpose of determining the effect of these defects. In test No. 13 the defective link broke through the

Table I

Static Tension Tests of Chain

Test No.	Size, in.	Weight of test chain, lb.	Elongation, in., after Proof load	Breaking load	Breaking load plus 40%	Load at rupture, lb.	Remarks,
1	1⅜	40	0.03	0.04	0.08	213,600	Broke No. 3 link. Section of metal solid.
2	1⅜	40	0.03	0.04	0.07	198,700	Broke No. 3 link. Section of metal few small blow holes.
3	1⅜	40	0.02	0.04	0.09	180,700	Broke No. 3 link. Section of metal honey-combed.
4	2	123	0.03	0.06	0.13	456,400	Broke No. 4 link. Small shrinkage in each fracture.
5	2	122	0.03	0.06	0.09	400,000	Broke No. 3 link. Section shows solid.
6	2	122	0.03	0.05	0.10	403,000	Broke No. 4 link. Section shows solid.
7	2	225	0.20	0.27	0.45	381,900	Broke top "E" link. Section shows few small blow holes.
8	2	223	0.10	0.22	0.63	346,500	Broke bottom "E" link. Section shows few small blow holes.
9	2	223	0.07	0.14	Not obtained	316,100	Broke bottom "E" link. Section shows few small blow holes.
10	2¼	174	0.05	0.09	0.20	494,400	Broke No. 1 link. Section shows solid.
11	2¼	174	0.07	0.13	0.33	495,400	Broke No. 3 link. Section shows solid.
12	2¼	175	0.06	0.11	0.22	513,200	Broke No. 5 link. Section shows solid.
13	2¼	172	0.02	0.05	0.14	502,400	Broke No. 3 link. Fractured through defect.
14	2¼	171	0.03	0.07	0.16	491,900	Broke No. 5 link. No. 3 link defective.
15	2	...	0.65	0.65	0.67	452,700	Broke No. 2 link. Section shows solid. See also dynamic test No. 4.
16	2⅞	251	0.00	0.00	0.00	764,700	Broke "E" link. Section shows few blow holes in one side.
17	2	...	0.72	0.73	0.74	467,400	Broke No. 3 link. Section shows small shrinkage one side. See also dynamic test No. 8.

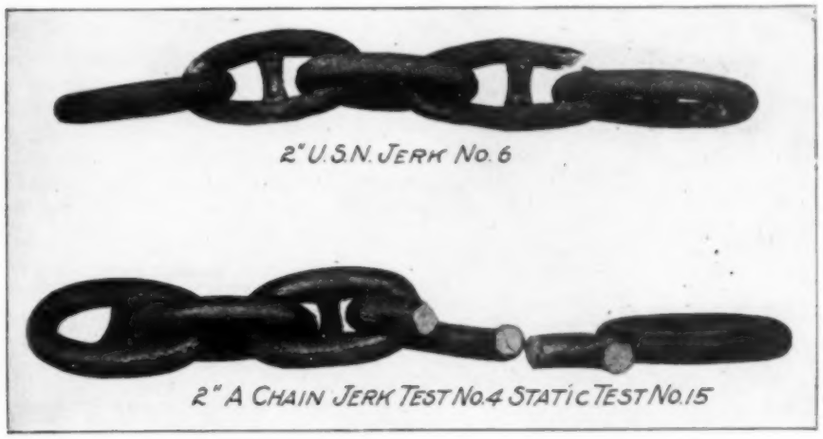


FIG. 18—UNITED STATES NAVY ANCHOR CHAIN AND "NACO" STEEL CHAIN BROKEN IN JERK AND STATIC TESTS

defect at 502,400 pounds and in test No. 14 the No. 5 link broke at 491,900 pounds, showing solid sections at the fracture. The second chain was retested, finally breaking through the defect in No. 3 link at 502,200 pounds. While neither of these chains would have been considered suitable for commercial purposes and the defects would have been readily detected on a casual inspection, it is quite interesting to note the slight effect of the imperfections.

Great Progress Made

Some reference should be made to our experience in the railway car-coupler field during the past 20 years, for the reason that experience has made possible the accomplishment of results in the cast steel chain problem in a few weeks which otherwise would have taken several years to attain.

The knuckle of the Master Car Builders' vertical plane type of coupler has involved a very serious and difficult problem, particularly in the past 10 years. Since the adoption of the Standard Master Car Builders' contour for that coupler in the early nineties, a standard which, because of the requirements of interchangeability, has remained substantially without change up to the present time, there have been enormous increases in locomotive tractive effort, size and weight of car equipment and tonnage hauled per train. The limitations of the M. C. B. contour, formed partly by the coupler head, and partly by the knuckle, have imposed certain fixed dimensions upon the size of the hub of the knuckle, its weakest point, which have effectually barred any substantial increase in section. The stress to which this hub section is subjected is really enormous, for the knuckle, which is in the form of a hook pivoted at its middle, transmits not only the entire tractive effort of the locomotive in pulling the train, but also receives shocks of great suddenness and intensity, both jerks and buffs, due to the surging of trains, the running out and in of "slack" during application and release of brakes, and in coupling by impact. Dynamometer car records have shown time and again that these pulls and buffs are frequently many times in excess of the tractive effort of the largest modern locomotives.

Notwithstanding the evil effects of knuckle distortion upon proper maintenance of contour, it has been felt for years that nothing but a material with high ductility would be capable of receiving these severe shock stresses. Part of the basis for this feeling has been the theory that a very ductile material would, by its elongation, absorb some of the shock and so save itself from rupture, but the difficulty with this is that *the major part of this elongation is available only after the elastic limit of the material has been passed.*

Have Standard Steel Coupler

Two possible solutions for this problem have presented themselves, the use of a special material with much higher capacity to resist both static and dynamic stresses, and the adoption of an entirely new and heavier coupler with modified contour, having sufficient sectional areas to make resort to special materials unnecessary. The latter method was followed by joint action of all the coupler manufacturers, under the initiative and jurisdiction of the Master Car Builders' association and today, after six or seven years's development, we have one standard coupler, somewhat heavier and very much stronger and with its knuckle able to meet the demands of service, though made of ordinary open-hearth steel.

Investigate Material

In the meantime, realizing the importance of the problem, and the probable length of time involved in developing a standard coupler, we began an exhaustive search for a suitable special material to use in our knuckles. In the early days we started making couplers by the acid open-hearth process, later changing to basic, but our experience with both these steels led us to believe that there was no possibility of increasing the tensile strength sufficiently without loss of ability to withstand shock which would only result in failure to withstand the required M. C. B. drop tests, which tended to compel the use of a soft material. We then began a series of experiments in the electric furnace with high-carbon steels heat-treated, and later with alloy steels. Marked improvements in tensile strength were the result but the ability to withstand shock did not increase and in many cases was diminished. Finally we arrived at a special material to which we later gave the name "Naco" steel, which combined with a high tensile strength extraordinary ability to withstand shock.

This material now used in our coupler knuckles, has raised their elastic limit more than 225 per cent, and their ability to resist shock stresses nearly 100 per cent, over ordinary open-hearth steel. The amount of shock which these knuckles will take without breakage or serious distortion is beyond anything in our experience, and we have been able to develop a specification of our own, along the lines of M. C. B. coupler specifications, but calling for only half the amount of knuckle distortion with the same amount of shock in the drop test, a feature of the great-

Table II

Dynamic Tension Tests of Chain

Test No.	Size, in.	Material	Elongation, in., after 3 blows at 5 ft.	10 ft.	15 ft.	20 ft.	25 ft.	Total blows at 25 ft.	Total blows at 30 ft.	Total blows at 35 ft.	Chain broke on	Total elongation,	Remarks
1	2	Wrought	0.02	0.05	0.15	...	...	..	..	..	1st at 20 ft.	0.15	†
2	2	Wrought	0.00	0.02	...	...	...	..	..	..	2d at 15 ft.	0.02	††
3	2	Wrought	0.00	0.02	...	...	...	..	..	..	2d at 15 ft.	0.02	††
4	2	Naco	0.01	0.05	0.09	0.13	0.27	50	20	..	None	0.65	*
5	2	U.S.Navy	0.10	0.34	0.68	1.37	2.21	6	..	..	6th at 25 ft.	...	**
6	2	U.S.Navy	0.06	0.32	0.74	1.32	2.08	10	2	..	None	3.85	***
7	2	Naco	0.02	0.02	0.03	0.05	0.10	10	1	..	None	0.72	****
8	2	Naco	0.08	0.10	0.15	0.19	0.27	10	10	10	1st at 30 ft.	0.24	*****

† Broke Nos. 4 and 5 links. †† Broke No. 1 link. * Chain installed in static machine. See static test No. 15. ** Broke No. 1 link through weld. *** Surface fractures in all links. Chain installed in static machine and broke No. 2 link at about 241,000 pounds. **** Broke No. 4 link. Section shows solid. ***** Chain installed in static machine. See static test No. 17.

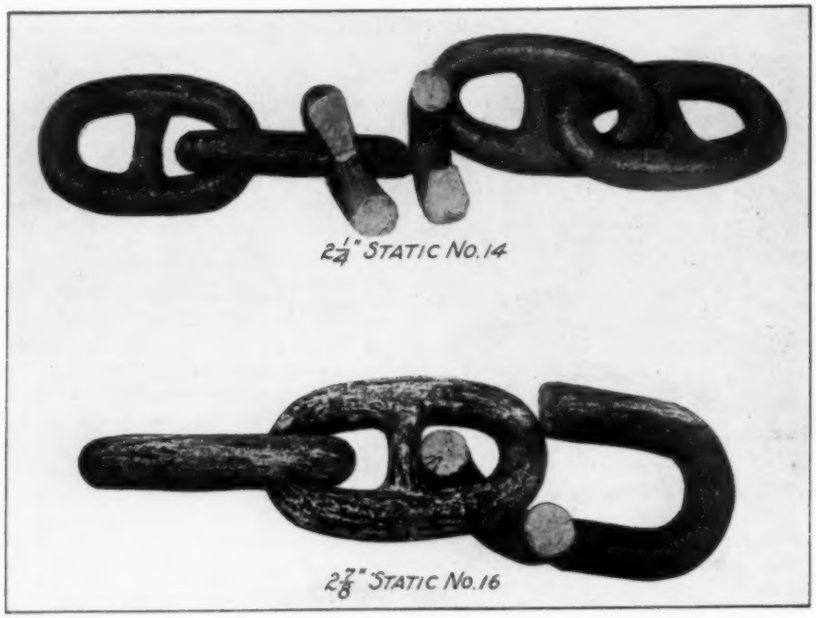


FIG. 19—NO STRONGER THAN THE WEAKEST LINK—CAST-STEEL ANCHOR CHAIN BROKEN IN THE STATIC TENSION MACHINE

est advantage in the maintainance of proper contour in service.

Our inspection department is using this M. C. B. drop-testing machine daily in the acceptance or rejection of our knuckle steel heats, and make on the average of 3000 tests per year. The performance in this machine is borne out in service by the record of more than a million knuckles in use without a report from any railroad or from our road service department, of a single failure of a knuckle since the experimental period was passed.

There are so many points of resemblance between the coupler-knuckle problem and that of cast steel chain as we understand it, that we were able to start at a point which otherwise must have taken years of study and development, with the results set forth. In our opinion, a proper specification for cast steel chain would require the making of links in dry sand molds or cores, but other details of manufacture should be left optional with the manufacturer. For the chemical requirements, the steel should be made by the electric furnace process, with phosphorus and sulphur limits of not over 0.04 per cent. The physical requirements should be sufficiently rigid to insure sound material and should embody a dynamic test sufficiently severe to put the ability of the steel to withstand shock beyond any question of doubt. For this latter purpose we believe the standard M. C. B. drop testing machine presents the most readily available commercial machine, and a shock test on short pieces of test chain similar to the tests carried out at our Sharon plant seems to be as closely representative of the service to which anchor chain is subjected as any laboratory test can be.

Technical Societies Form Joint War Committee

In an effort to co-ooperate vigorously and effectively for war work, representatives of various technical societies centered in Chicago have created a joint war committee, with headquarters at 1735 Monadnock block, Chicago. Inaugurated by the military committee of the Western Society of Engineers, the movement gained headway and recently the "War Committee, Technical Societies of Chicago" was formed. The following member societies are co-operating in the effort:

Western Society of Engineers,
Structural Engineers' Association of Illinois,
Society of Industrial Engineers,
Illinois Society of Engineers,
Illinois Society of Architects,
American Railway Engineering association,
Swedish Engineers' Society of Chicago,
Illinois Association of American Society of Civil Engineers,
American Institute of Architects, Illinois chapter,
American Society of Mechanical Engineers, Chicago section,
American Institute of Electrical Engineers, Chicago section,
American Chemical Society, Chicago section,
American Institute of Mining Engineers, Chicago section,
Society of Automotive Engineers, mid-west section,
American Society of Heating and Ventilating Engineers, Chicago section,
American Society of Refrigerating Engineers, Chicago section,
Steel Treating Research Society, Chicago section,
Illuminating Engineering Society, Chicago section,
American Association of Engineers, Chicago chapter.

For its purpose, the organization has the aim to call into action the efforts of the members of the various societies represented as occasion may arise; to co-ordinate their activities in the most effectual manner possible to help to win the war and to place at the disposal of the United States government and other authorized agencies the combined strength and resources of the Chicago technical societies for war work as need may arise.

Officers of the war committee are as follows: Chairman, F. K. Copeland; vice chairman, W. L. Abbott; secretary, Edgar S. Nethercut, and treasurer, William A. Fox. The executive committee is composed of the following: F. K. Copeland, W. L. Abbott, William Hoskins, C. A. Keller, Charles E. Lord, C. F. Loweth, Isham Randolph and Richard E. Schmidt.

Builders Prepare to Give Greater War Service

Representatives of a number of national associations affiliated with the building trades met in informal conference with the building industries of New York at the Engineers' club, recently, and formulated plans to coordinate the building industries of the country on a basis that would place them more readily at the disposal of the government during the war. The general expression of sentiment was that "the industries must be adjusted to the government and not the government to the industries." It was felt that the time had arrived when unified effort would accomplish the best results. H. H. Murdock, chairman of the Building Industries of New York, introduced Allen Walker, of the Chamber of Commerce of the United States, who acted as chairman. Mr. Walker said the aim was to outline an organization which would give representation to all branches of the industry.

A committee was appointed to formulate plans of organization. The members of the committee are: F. H. Chapin, Cleveland, vice president of the Hydraulic Pressed Brick Co.; A. M. Maddock, Trenton, N. J., president of Thomas Maddock Son's Co.; W. D. Baldwin, New York, of the Otis Elevator Co.; W. H. Powell, New York, of the Atlanta Terra Cotta Co.; George F. Lindsey, Minneapolis; F. Y. Miller, of the F. W. Dodge Co.; B. F. Affleck, of Chicago, president of the Portland Cement association; Colonel J. R. Wiggins, of Philadelphia, president of the National Association of Builders Exchanges; and H. H. Murdock, chairman of the board of directors of the Building Industries of New York.

Concessions Made in Steel Standards

Testing Society Increases Rejection Limits of Sulphur and Phosphorus in Forty Specifications—A 200-pound Rail Considered—Cast Steel Chain Manufacture is Discussed

CONCESSIONS in the maximum sulphur and phosphorus limits of forty standard and tentative steel specifications was the ranking action taken at the twenty-first annual meeting of the American Society for Testing Materials, held at the Hotel Traymore, Atlantic City, N. J., June 25 to 28. The rejection limit of sulphur in all steels and phosphorus in acid steels was raised 0.01 per cent. For many months steel manufacturers have experienced increasing difficulty in complying with the chemical requirements of existing standards due to the low grade of fuel available and the inability to obtain low-phosphorus stock. Due to their anxiety to obtain steel, many purchasers have allowed temporary modification of specifications. However, the situation became so critical that it was recognized by both producers and consumers that official action was essential and the concessions granted will relieve a situation that was causing great embarrassment.

Although only a progress report was submitted by the subcommittee on rails, its reference to a 200-pound section that is being considered by one railroad marks a development induced by the increasing wheel loads and dense traffic on the tracks of the leading trunk lines since the beginning of the war. Reports received by the committee indicate a greatly lessened number of failures since rails weighing 100 pounds to the yard and over have come into more general use. Cast steel anchor chain, poured from metal made by the electric process, was the subject of three papers and a proposed specification adopted as tentative. This is a distinct war product since the capacity of the existing welded chain plants is only one-third of the requirements of the greatly expanded shipbuilding program. Within a period of less than one year this product was developed, tested and is being manufactured on an extensive commercial scale.

The topical discussion on greater co-operation in industrial research aroused much interest and the establishment of a central clearing house or bureau where the results of all research laboratories will be cataloged, will prevent much duplication of effort.

The application of the motion picture machine to recording the action of physical tests of iron and steel is a novel use of this equipment that affords another channel for the investigation of the properties of both ferrous and nonferrous products. Prof. H. F. Moore displayed motion photomicrographs of the fatigue failure of wrought iron, made at the University of Illinois. The area of the specimen under the lens was only 0.03 square inch and when enlarged upon the screen the action of the metal to the time of rupture was clearly discernible.

Albert Ladd Colby who was delegated by the society as its representative at an International Aircraft conference held in London several months ago, made a report on the progress in preparing international specifications for steel for aircraft production. In addition to the American representatives, delegates were in attendance from all of the allies and it is the purpose to formulate standards whereby steel for English aircraft may be purchased in the United States for example, or from any of the allied nations under one recognized standard. A meeting of an Interallied Aircraft Standards commission will be held in London in the near future. Mr. Colby spent some eleven weeks abroad on this work.

The deliberations of the society were spread over ten sessions and the program provided for the consideration of fifty-seven topics. The tremendous amount of work done by the committees was reflected by the large number of specifications presented for revision or adoption. These totaled 93, divided as follows: Revision in standards, 22; tentative standards, 30; revision in tentative standards to be continued as tentative, eight; tentative standards continued without revision, 18, and new tentative standards, 15. The book of standards published by the society biennially heretofore, will be printed this year and again in 1921, a lapse of three years. The total membership is now 2261, an increase for the year of 94.

In spite of the large number of members of the organization in the service, war conditions, etc., the attendance exceeded last year's and broke all records. Unfortunately the retiring president was unable to be present. General W. H. Bixby is again in active duty, being stationed at St. Louis. Another absentee was Secretary-Treasurer Edgar Marburg, due to critical illness. Later the announcement of his death cast a gloom over the closing sessions of the meeting. An impressive tribute was paid his memory in the adoption of a resolution, prepared by a committee consisting of Past Presidents Arthur N. Talbot, A. A. Stevenson and Henry M. Howe. Following the reading of the resolution, there was a rising vote, followed by a minute of silence.

Increased Sulphur and Phosphorus

IN recognition of the difficulties experienced by steel manufacturers in producing material that will conform to the low maximum sulphur and phosphorus limits prescribed by the society's specifications, it was decided, upon recommendation of the committee on steel, to raise the sulphur limits on all steels and the phosphorus maximum in acid steels, 0.01 per cent. This change became effective upon its adoption, Wednesday, June 26, and the usual course of procedure to refer to letter ballot was waived in view of the urgency of the situation. This change in chemical requirements is to continue for the duration of the war and until otherwise ordered by the society. It affects 40 steel specifications and will result in the release of an immense tonnage of steel, which if shipped under

the former chemical standards might have been rejected.

Final action upon this far-reaching change in steel specifications was not taken by the committee until several days before the meeting. Earlier in the year a meeting of the committee was held to discuss this subject, but at that time it was not considered advisable to make any change in the existing specifications. It was concluded that any concessions that might be made should be of concern to buyer and seller only, but it was urged that a record of all such transactions be kept and the behavior of the material studied to form a basis for future investigation and probable subsequent revision of existing standards.

Only Low Grade Fuel Obtainable

On account of the increased demands for steel coupled with inability to obtain low-sulphur fuels and melting materials sufficiently low in phosphorus, the steel manufacturers have experienced increasing difficulties in complying with specifications. Notwithstanding conditions, many consumers insisted upon the strict adherence to the standards of chemical requirements fixed by the American Society for Testing Materials, with the result of a constantly increasing volume of rejection. It was concluded, therefore, that temporizing with the situation that confronted the steel trade, would only cause further embarrassment to both producer and consumer in a time of dire need and action was taken that will afford much needed relief.

To avoid the necessity of changing the substance of the specifications it was decided to add a note to each standard to be inserted under the title directing attention to the concession in sulphur and phosphorus for the duration of the war. This note follows:

"In view of the abnormal difficulty in obtaining materials in time of war, the rejection limits for sulphur in all steels and for phosphorus in acid steels shall be raised 0.01 per cent above the values given in these specifications. This shall be effective during the period of the war and until otherwise ordered by the society."

Standard Specifications Affected

The complete list of standard and tentative specifications affected by this change is presented herewith:

Carbon steel rails.
Open-hearth steel girder and high tee rails.
Low carbon steel splice bars.
Medium carbon steel splice bars.
High carbon steel splice bars.
Extra high carbon steel splice bars.
Quenched high carbon steel splice bars.
Quenched carbon steel track bolts.
Quenched alloy steel track bolts.
Structural steel for bridges.
Structural nickel steel.
Structural steel for buildings.
Structural steel for locomotives.
Structural steel for ships.
Rivet steel for ships.
Carbon steel bars for railway springs.
Carbon steel bars for vehicle and automobile springs.
Silico-manganese steel bars for automobile and railway springs.
Billet steel concrete reinforcement bars.
Blooms, billets and slabs for carbon steel forgings.
Carbon steel and alloy steel forgings.
Quenched and tempered carbon steel axles, shafts and other forgings for locomotives and cars.
Carbon steel forgings for locomotives.
Quenched and tempered alloy steel axles, shafts and other forgings for locomotives and cars.
Carbon steel car and tender axles. (Increase in sulphur maximum does not apply.)
Cold rolled steel axles.
Wrought solid carbon steel wheels for steam railway service.
Wrought solid carbon steel wheels for electric railway service.
Steel tires.
Steel castings.
Lap-welded and seamless steel boiler tubes, boiler flues, superheater pipes, safe ends and arch tubes for locomotives.
Lap-welded and seamless steel and wrought-iron boiler tubes for stationary service.
Automobile carbon and alloy steels.
Cold-drawn bessemer steel automatic screw stock.
Cold-drawn open-hearth automatic screw stock.
Structural steel for cars.

Increased phosphorus and sulphur limits also apply to the following tentative specifications:

Steel tie plates.
Bars for railway springs.
Boiler and firebox steel for stationary service.
Low carbon steel track bolts.

Specifications Not Affected

No changes were made in the chemical requirements of the specifications for boiler and firebox steel for locomotives and boiler rivet steel. The committee reported a tie vote on the proposition of increasing the sulphur limits of both of these standards and when presented to the convention for consideration a prolonged discussion was precipitated. Members representing the railroad interests strongly opposed an increase in the sulphur content of locomotive firebox steel. It was pointed out that the service to which this material is subjected is unusually severe and that a concession in the sulphur tolerance would increase failures. In view of the shortage of steel, it was stated that the situation would not be benefited if the railroads were compelled to increase their purchases of firebox steel by reason of an increased sulphur content which might prove helpful to the steel manufacturers in furthering production of this material. When put to a vote, the decision was unanimous against a change and as conditions applying to boiler rivet steel were similar, the subject was not presented for discussion.

Specifications Revised

Both in volume and number of subjects considered, the report of the committee on steel ranked first among the many committee reports presented. Revisions in mine specifications proposed at the last annual meeting were passed upon favorably and were referred to letter ballots. These include changes in the following standards: Carbon steel and alloy steel forgings; carbon steel car and tender axles; welded steel and wrought iron pipe; boiler and firebox steel for locomotives; quenched and tempered carbon steel axles, shafts, etc.; quenched and tempered alloy steel axles, etc.; lap-welded and seamless steel boiler tubes, etc., for locomotives; lap-welded and seamless steel and wrought iron boiler tubes for stationary service; automobile carbon alloy steels and blooms, billets and slabs for carbon steel forgings. Revisions in two specifications were proposed for the first time and were adopted as follows: Blooms, billets and slabs for carbon steel forgings and steel tires.

The revisions in the specifications for structural steel for cars, which were proposed but subsequently withdrawn, provided requirements for plates for forge welding. This subject was considered at the request of the tank car committee of the Master Builders' association and other interested consumers and the committee gave careful consideration to specifications for plates for welding. However, since the meeting of the committee it developed that these requirements are not entirely satisfactory to the welding companies which use these plates and the subject will be reconsidered.

Changes in Forging Billet Specifications

In its report last year the committee proposed certain revisions in the specifications for blooms, billets and slabs for carbon steel forgings relating exclusively to the chemical requirements of carbon and alloy steel billets. It was recommended that these specifications be divided into two classes differing in the methods of sampling for chemical analysis and in chemical requirements. The entire section referring to check analysis of the existing specification is to be replaced by another section which covers this subject in much greater detail. This divides the forging billets into classes 1 and 2 and for the latter the purchaser, or his representative, may select one top cut billet from which to make check analyses to represent each melt. Two sets of drillings shall be taken from the top face of this billet on the same diagonal of the billet. The drilling shall be taken with a $\frac{5}{8}$-inch drill, parallel to the axis of the ingot as cast. The distance from the center of the billet to the drilling points shall be, respectively, 15 and 80 per cent of the length of the half diagonal of the billet. From the drillings taken at the 80 per cent point, a complete analysis may be made. The chemical composition thus determined shall conform to the requirements specified. From the drillings taken at the 15 per cent point, a carbon determination may be made. The difference between the car-

bon content of the drillings from the 15 per cent point and that of drillings of the 80 per cent point, expressed as a percentage of the latter, shall not exceed 15 per cent for billets, 15 inches or under in thickness, nor 20 per cent for billets over 15 inches in thickness. If in any melt the drillings do not conform to the requirements, additional drillings may be taken in a similar manner after making a further top discard from the material from each ingot of at least 10 per cent of the original ingot weight. The results of this analysis shall conform to the requirements specified or the melt represented shall be rejected.

Changes in Chipping

Important changes also were made in the section under the chipping caption. At present the specifications provide that billets may be chipped to a depth not over ½-inch, unless otherwise specified, and it shall be done in such a manner as not to cause laps when the billets are properly forged. The new section provides that billets may be chipped to remove surface defects provided that the depth of the chipping does not exceed 1/16-inch for each inch of dimension up to a maximum depth of ¾-inch and provided that the width of the chipping is at least four times its greatest depth, except that in the case of slabs, where the width is at least twice the thickness, the depth of the chipping on the wide surfaces may exceed this allowance by 50 per cent up to a maximum depth of ¾-inch. In special cases, particularly in large alloy steel billets, where it is necessary and not injurious, greater depth of the chipping may be permitted by special agreement between the manufacturer and the purchaser. The vote on these changes developed considerable opposition, although 48 members of the committee cast affirmative ballots against 27 negative.

Revisions in the specifications for locomotive boiler tubes were made in the sections on hydrostatic tests, number of tests, finish and marking. These were changed to harmonize these specifications with the standard specifications for lap-welded and seamless steel and wrought iron boiler tubes for stationary service. This specification was referred to letter ballot for adoption. The committee is co-operating with the boiler code committee of the American Society of Mechanical Engineers through the American Society for Testing Materials representatives on a joint conference committee with reference to revising the tentative specifications for boiler and fire-box steel to differentiate more sharply between the two grades. At a meeting of the committee it was decided to recommend that the specifications be continued as tentative.

Although presented last year, the tentative specifications for carbon tool steel were not recommended for adoption as standard and the committee requested that they be continued as tentative for another year. A comprehensive series of bend tests to be incorporated in the various steel specifications now is being conducted, but definite results are being delayed owing to the pressure of war orders on the steel mills.

Wrought Iron Standards Revised

Minor revisions in form and substance were submitted in the various specifications offered for consideration by the committee on wrought iron. The specifications for charcoal iron boiler tubes were changed to harmonize with those for steel boiler tubes. Other specifications referred to letter ballot for adoption included the following: Staybolt iron, engine-bolt iron, refined wrought iron bars, wrought iron plates and iron and steel chains. Inquiries were made by the committee with reference to the preparation of specifications for very large wrought iron forgings, among large engine and machinery builders who might be purchasers, but it was ascertained that the majority use steel for this purpose and that there is no demand for such a specification. However, the following subjects will be considered by the committee: Definition of terms applied to various grades of wrought iron; investigation of "Busheled Steel"; further study of the vibratory test and specifications for hollow staybolt iron.

Resolutions on Death of Edgar Marburg

THE American Society for Testing Materials, in annual meeting assembled learns with profound sorrow of the death of its esteemed secretary-treasurer, Edgar Marburg, on June 27, 1918.

In this hour of bereavement the society desires to place on its records an acknowledgment of the great debt which it owes to Edgar Marburg. By zeal, industry, loyalty, insight and high ability exerted through 16 years as secretary-treasurer of the society, by guiding its actions, energizing its activities and guarding its name, he has exercised a powerful influence on the character, standing and usefulness of the society and on the making of specifications and tests for the materials of engineering. He is honored and revered as a master and leader. The imprint of his work will long remain.

The society extends to the family heartfelt sympathy for their great loss. May the knowledge that his fine character, strong manhood and great work in the field of engineering are appreciated by the membership of the American Society for Testing Materials, become a part of their many treasured memories of his life and work.

Arthur N. Talbot
A. A. Stevenson
Henry M. Howe

Consider Two-Hundred-Pound Steel Rail

THAT a rail section weighing 200 pounds per yard is a development of the not distant future, was reported by the subcommittee of the committee on steel in its discussion of "The Rail Situation". Owing to the increase in the wheel loads and the very dense traffic, particularly in the last 12 months, many of the railroads have gone to sections considerably over 100 pounds per yard, while one of these roads now has in contemplation a 200-pound rail. The railroads employing sections in excess of 100 pounds report greatly reduced cost of track maintenance and reduction in number of failures, as well as better riding track. A general trend toward a reduction in the number of failures was reported by the committee.

Experiment With Heat Treated Rails

The results of tests of heat-treated rails indicate also that they may have a future. Many experiments have been made in the quenching and annealing of rails and when put in service they showed markedly greater resistance to abrasion, but some failed due to brittleness. However, heat-treated rails now are in service carrying heavy traffic under severe conditions and on heavy curves, which have not developed a tendency toward brittleness.

The committee reported that records of performance in service of different types and weights of rails will be of comparatively little value in the absence of data giving the ton mileage carried by the rail before failure. The committee also directed attention to a possible change in the society's rail specifications covering straightening due to the stiffer sections of the recent heavyweight rails. It is probable that the standard distance of 42 inches now prescribed in the specifications will have to be increased to meet the necessi-

ties of the heavy rails toward which the railroads are tending.

Reference was made to the valuable work done by a committee of the American Railway Engineering association in determining the effect of wheel loads of various weights in producing distortion of the rail head. The results indicate that marked distortion is produced by weights considerably under those in common use today. However, the relation of this distortion to rail failures has yet to be determined, though the movement has now sufficient headway to suggest early knowledge.

Research Laboratories Should Co-operate

CO-OPERATION in industrial research was the subject of a topical discussion introduced by Dr. Henry M. Howe, chairman of the engineering division of the National Research council. Others who contributed included John Johnston, secretary of the National Research council, who discussed recent developments in Great Britain; Arthur D. Little, Arthur D. Little, Inc., Boston, who outlined the organization of industrial research. "Co-operative Research in the American Canning Industry" was discussed by Frank E. Gorrell, secretary of the National Canners' association, Washington. J. S. Unger, Carnegie Steel Co., Pittsburgh, presented "Some Practical Views of Research", and Alfred D. Flinn, secretary, United Engineering society, discussed the "Development of Existing Agencies".

Impressed by the paramount importance of promoting the application of science to industry in this country, the National Research council has taken up the question of the organization of industrial research. Dr. John Johnston, secretary of the National Research council, pointed out that one of the most striking consequences of the war is the increasing general realization of the primary importance of scientific research to the whole question of national defense as well as to the successful prosecution of industry. In his introduction to this discussion, Dr. Howe pointed out that every research consists of four distinct parts, namely, selection, planning, execution and interpretation. He added that the engineering division of the National Research council expects to devote a large part of its energies to producing the co-operative spirit in industrial research and he asked the members of the society to point out fields in which such research is urgently needed.

Research in Great Britain

Industrial research in Great Britain was discussed by John Johnston, who pointed out that the list of researches to which government recognition has been given in England, includes laboratory glass, optical glass and glass technology, hard porcelain and refractory materials, tin and tungsten, corrosion of nonferrous metals, properties and composition of alloys, tool steel experiments, statistical work in preparation of field for research in iron and steel, flow of steam through nozzles, methods of notched bar impact testing and hardness tests for journals and pins, the determination of structures of metal, concrete and timber in sea water, etc.

Arthur D. Little broadly summed up the following aims of a research organization:

To find, develop and train men.

To create such a background in the public mind as shall insure support for research and the industrial utilization of research results.

To secure co-operation between different branches of science, as for example between chemists and mathematicians.

To avoid repetition and duplication of effort, first by rendering present knowledge readily available to research workers, second by applying clearing house methods to research projects.

To stimulate research by emphasizing the importance of specific problems, making special grants, rendering material and facilities as generally available as possible.

To furnish a general staff for research which shall work out the plan of attack for major problems, assign the several lines to competent workers and co-ordinate and focus the whole.

To bring home to manufacturers the advantages of research with the view of promoting the establishment of private, corporation and group laboratories.

To make and publish a census of available research facilities in men and equipment.

To survey the natural resources of the nation and direct research toward their development.

To appraise our great industrial wastes and develop plans and methods for turning them to profitable use.

Mr. Little concluded by stating that the natural place for industrial research is in the laboratories controlled or supported by individual corporations or which are for the time being working in their interest, or in group laboratories maintained by trade associations for the common benefit of their membership.

Practical Research

J. S. Unger, manager of the central research laboratory, Carnegie Steel Co., Pittsburgh, presented some practical views of research based on experience of many years. He said that it should be the aim to carry out tests as will approximate the trying conditions of service. He pointed out that a proof load test for a chain is better than a chemical analysis of the material; a hydrostatic test for a pipe or tube rather than a microscopic examination; exposure of metallic sheets to atmospheric corrosion instead of their rate of solubility in dilute acid; a ballistic test of a helmet in place of a determination of the heating curve of the steel; the softening point of a brick under working conditions in place of the temperature at which a fragment becomes liquid; the performance of a railroad rail, wheel or axle on an experimental track rather than a drop test.

It is foolish, argued Mr. Unger, to investigate a subject by methods which cannot be applied commercially because of their excessive cost, interference with preceding or subsequent operations and the uncertainty of their value when applied. He cited, as an example, the addition of ferromanganese in large lumps to metal in the ladle, which will show a low manganese loss, but cannot be recommended owing to its uncertainty of thorough melting and distribution.

Among other pertinent suggestions regarding research work, Mr. Unger offered the following:

"In research work, it is advisable to use quantities approaching actual size as nearly as possible. To make a few ounces of metal in a crucible and afterward forge this metal into a specimen ½-inch in diameter, then heat-treat and test the material to show particularly high qualities, is neither impressive nor convincing evidence to one who must prepare a similar metal in 50-ton lots, cast it into ingots weighing several tons, roll it in a mill into pieces 12 inches in diameter and later test the rolled material. The same results cannot be obtained in the larger mass, yet the trade may demand the properties shown by the smaller piece.

"Many tests are regularly made which do not represent service conditions and can only be classed as checking or uniformity tests. Does it not appear absurd to test a cement briquette or a steel column by a tension test? Such tests have little practical value other than a check on the uniformity of the material. Do we not need to change many of our methods of testing to conform more closely to service conditions?

"The essentials to successful research

work are an adequate and complete equipment, so as to be able to duplicate works conditions; if such is not possible, the use of the facilities of the works.

"Research of greatest value to the steel industry is that careful study of things comparatively well known, to substitute facts for theories or beliefs, to promote desirable economies or improve qualities, and to distribute such information to those who may be able to use it in an intensely practical way."

Alfred D. Flinn made a plea for closer co-operation among the centralized agencies already in existence for promoting industrial research. The bodies for centralized activity in research in applied science are the National Research council; United Engineering society with its subsidiaries, the Engineering Foundation and Engineering Societies' library, back by the great national societies of professional engineers and the government bureaus engaged in research. While all of these bodies now are co-ordinated and are co-operating to some degree, Mr. Flinn pointed out that their relationships should be more clearly defined and firmly established. He presented a list of 351 laboratories in the United States engaged wholly or partly in research work of which 80 are operated in connection with iron, steel and other metal-working plants.

"The Developments in Industrial Research" were briefly discussed by Charles L. Reese, chemical director of the E. I. du Pont de Nemours & Co., Wilmington Del., and Frank E. Gorrell, secretary of the National Canners' association, briefly discussed the plan of co-operative research in the American canning industry.

Nonferrous Metals and Alloys

THE constantly growing interest of the American Society for Testing Materials in the preparation of standard specifications for nonferrous metals and alloys was indicated by the large number of new standards submitted for consideration. Numerous changes were made in the tentative specifications for the sand-cast alloy consisting of copper, 88 per cent; tin, 10 per cent, and zinc, 2 per cent. A new section was added to this specification which provides that an analysis of each melt shall be made by the manufacturer. The chemical composition thus determined shall be reported to the purchaser or his representative. This specification also provided for a tensile strength of 33,000 pounds per square inch with an elongation in 2 inches of 14 per cent. The tensile strength, however, was reduced to 30,000 pounds per square inch, a yield point of 15,000 pounds per square inch was added, while the elongation remains at 14 per cent. The paragraph of this standard referring to materials which do not conform to the specifications as indicated by the purchasers' tests and which provides for a retest, has been changed considerably.

Specifications for Bearing Alloys

Tentative specifications for white metal bearing alloys, known commercially as babbitt metal, also were submitted. These embrace a series of 12 alloys which may be modified as experience may dictate. An interesting and valuable table giving the physical properties of these bearing alloys also is included in these specifications. Tentative specifications for copper plate for locomotive fire boxes, for copper bearings for locomotive staybolts, for seamless copper boiler tubes and for seamless brass boiler tubes were referred to letter ballot for adoption.

G. H. Clamer, chairman of the subcommittee on nonferrous alloys for railway equipment, recommended numerous changes in the tentative specifications for nonferrous alloys for railway equipment in ingots, castings and finished car and tender bearings. He recommended that the four bearing metals be changed to three and these specifications remain tentative because there is still some doubt as to the proper limits of the composition of these alloys. The members of this committee are convinced of the desirability of having a hard alloy for those bearings which are subjected to alternating or impact blows. A softer alloy than bearing metal No. 2 for driving brass, truck brasses and hub liners was agreed to and since it was the unanimous opinion of the committee members that the zinc content of 5 per cent in bearing metal No. 4 was too high for the best practice, it was decided to compromise between alloys Nos. 3 and 4 and the maximum zinc content recommended is 2.50 per cent.

Tentative specifications for aluminum ingots, aluminum sheet and aluminum for castings were presented. Methods for the chemical analysis of manganese bronze and gun metal were submitted and will be published by the society as tentative. These methods are used in the laboratories of some brass and bronze producers and will be tested critically by members of the committee and other chemists who have consented to co-operate.

Season Cracking of Brass

"Season and Corrosion Cracking of Brass" was the subject of a topical discussion that considered every phase of this subject. It was formally introduced by the following speakers who discussed various features of this phenomenon: "Season Cracking and Splitting of Tubes and Pipes," by Dr. William Campbell, professor of metallurgy, Columbia University, New York; "The Causes and Prevention of Corrosion Cracking," by W. H. Bassett, technical superintendent and metallurgist, American Brass Co., Waterbury, Conn.; "Season Cracking," by W. Reuben Webster, superintendent, Bridgeport Brass Co., Bridgeport, Conn.; "Initial Stress and Corrosion Cracking," by P. D. Merica and W. R. Woodward, assistant physicists, United States bureau of standards, Washington, D. C.; "The Prevention of Season and Corrosion Cracking of Brass Artillery Cases by Special Heat-Treatment," by W. B. Price, chief chemist and metallurgist, Scovill Mfg. Co., Waterbury, Conn., and "The Use of Mercury Solution for Predicting Season Cracking in Brass," by Henry S. Rawdon, United States bureau of standards.

Corrosion Cracking of Cartridge Cases

P. D. Merica and R. M. Woodward stated that corrosion cracking has been observed in the case of cartridge cases and condenser tubes and they pointed out it is not limited in its occurrence to any form or shape of brass article, but has been known to occur in drawn, rolled, forged, spun and cast metal. Brass of a composition between 45 and 20 per cent zinc is subject to it and not only brass of these compositions, but also other metals such as nickel silver, nickel steel, aluminum, aluminum bronze and other alloys have been similarly affected. They are of the opinion that initial stress is the primary factor in either corrosion or fire cracking, and that this is due to some operation of manufacture such as heating, rolling or mechanical working that may not be applied uniformly to every portion of the article.

Strains Relieved by Reheating

W. B. Price, Scovill Mfg. Co., Waterbury, Conn., directed attention to tests

made by Professor E. Heyn who stated that reheating at temperatures varying from 100 to 230 degrees Cent. gradually relieved the internal strains. The composition of the cold drawn brass rod subjected to this treatment was copper, 57.8 per cent; zinc, 40.8 per cent; and lead, 1.35 per cent. Mr. Price reported the results of experiments made on four lots of finished 75-millimeter cartridge cases which had cracked at the mouth and base when subjected to the government test of immersion for a period of four hours in a 1.5 per cent solution of mercury-bichloride. A number of shells from each of the four lots tested were heat-treated for periods of one, two and three hours at a temperature of 260 degrees Cent. Some of the shells were removed at the end of the first, second and third hours of heat-treatment. While the physical properties were not apparently affected by this treatment, nevertheless the degree of internal strains was greatly diminished. None of the 12 cases tested from each of the four lots after heat-treatment failed in the mercuric-chloride test much to the satisfaction of those making it.

Electric Cast Steel Anchor Chain

GREAT interest was manifested in the various papers on cast steel anchor chain and the specifications that already have been prepared covering the manufacture and properties of this material. Although the shortage of anchor chain was pointed out only 10 months ago, a product already has been developed which is claimed to be equal to, if not superior to wrought iron chain. Also, it can be manufactured more speedily and economically than the latter, while the available plant capacity for its production is equal to the needs of the country's tremendous shipbuilding program. The papers on cast-steel chain are presented practically in full elsewhere in this issue.

New Specifications

On March 16, the new specifications for cast-steel chain were considered by a newly appointed committee of the Testing society, and after making some slight revisions, were presented as tentative for adoption next year.

These specifications include the cast steel to be used in all parts of the complete chain, including stud links, enlarged links, end links, shackles and shackle pins for anchor chain, 1⅜-inches and over. The steel is to be made by the electric furnace process and all castings shall be produced in dry sand molds or cores. The specifications also provide that the chain shall be heat-treated.

Development of Idea

The subject was introduced by H. Jasper Cox, who traced the developments in the manufacture of chain and reviewed the experiments and tests made by the General Electric Co. and the National Malleable Castings Co. In the discussion, W. L. Merrill, General Electric Co., stated that when the manufacture of this chain was undertaken, it was decided to make a commercially practical composition of cast steel, which, while easily cast, would be soft and ductile. A steel containing 0.30 per cent carbon was selected to which the desired degree of ductility could be imparted by simple heat treatment. The steel, while not especially high in strength, is stronger than wrought iron and which has a sufficient elongation and reduction of area to indicate a good degree of ductility. The average of tests made on a great many heats gives about 35 per cent reduction of area and 29 per cent elongation.

How Chain is Molded

Chester K. Brooks discussed in detail the tests made by the National Malleable Castings Co. Molding methods also were outlined. Mr. Brooks' remarks are printed elsewhere.

Malleable Iron Specifications Revised

PROPOSED tentative specifications for malleable cast iron for railroad work, presented before the society last year, were submitted in amended form and again were adopted as tentative. The standard, in addition to railroad work, now applies also to castings for motor vehicles, agricultural implements and for general machinery. The transverse test also has been eliminated and the tensile test is based on annealed heats in place of heats cast in the foundry. This change has greatly strengthened these specifications and makes it more difficult for the manufacturers to comply with their requirements. The tensile test remains unchanged at 45,000 pounds per square inch, with an elongation in 2 inches of 7.5 per cent.

The new clauses referring to the treatment of tension test specimens, follow:

"A set of three tension test specimens shall be cast from each heat without chills, using heavy risers of sufficient height to insure sound bars, and suitably marked to insure identification with that heat. Each set of specimens so cast shall be placed in some one oven containing castings to be annealed.

"After annealing, three tension test specimens shall be selected by the inspector representing the castings in the oven from which these specimens are taken.

"If the first tension specimen conforms to the specified requirement, or if, in the event of failure of the first specimen, the second and third specimens conform to the requirements, then the castings in that oven shall be accepted, except that any casting may be rejected if its test lug shows that it has not been properly annealed. The failure of either the second or third test specimen shall reject the entire contents of that oven.

"Any casting rejected for insufficient anneal may be reannealed once. The reannealed casting shall be inspected and if the remaining test lugs, or castings broken as specimens, show the castings to be thoroughly annealed, they shall be accepted; if not, they shall be finally rejected."

Heretofore the preparation of malleable iron specifications was in charge of a subcommittee of the general committee on cast iron. Recently a separate committee on malleable iron was authorized not affiliated with the cast iron committee. H. E. Diller, General Electric Co., Erie, Pa., is chairman, and Enrique Touceda, Albany, N. Y., secretary.

Sulphur in Gray Iron Increased

Specifications for soil pipe and fittings which have been tentative for a year as well as an increase in the maximum sulphur content in light gray iron castings from 0.08 to 0.10 per cent were recommended to letter ballot for adoption. The recent organization of a committee on malleable iron not affiliat-

ed, as heretofore, with the general committee on cast iron, served to defer action on the specifications for railroad malleable iron castings, which have been in tentative use for a year. Richard Moldenke, chairman of the committee on cast iron reported that the introduction of a hardness test for cast iron and the behavior of cast iron when subjected to superheated steam are topics that will be investigated by his committee.

Engineering Standards Committee

Affiliation with the American engineering standards committee was heartily endorsed by a unanimous vote. This new body which will supervise the adoption of standard specifications for all materials will be constituted of members of the following five leading technical organizations: American Society for Testing Materials, American Society of Civil Engineers, American Institute of Mining Engineers, American Society of Mechanical Engineers and American Institute of Electrical Engineers. Government participation is sought through representatives of the army and navy and department of commerce. The standards committee is to consist of 15 members, three to be appointed by each of the five societies named. Any society may become a co-operative member by prescribing to the rules of the committee. A request for the preparation of a standard specification may be made by any organization and this will be referred to one of the five societies qualified to undertake the work. After a new specification has been adopted by a sponsor society it is finally referred to the standards committee for consideration and adoption.

This committee will serve as a clearing house for all standard specifications and will eliminate much of the conflict which now exists as the result of the duplication of standards. The organizations that are compiling specifications are constantly growing more numerous and this standards committee will eliminate much of this unnecessary effort.

To Build Ship Fabricating Plant at Birmingham

Birmingham, Ala., July 2.—The Emergency Fleet corporation is behind the purchase of 50 acres in the city's limits by Harry Leon Brittain, the site to be used for the construction of a plant to fabricate ship steel. It is planned to have the first unit of the plant in operation in about six months. This unit will cost at least $1,000,000 and the completed plant will cost many times that sum, it is said. Steel for the new plant will have to be obtained through government assistance in all producing districts, for while the bessemer plant of the Tennessee Coal, Iron & Railroad Co. has been furnishing steel plate for shipbuilding purposes, the production there is not sufficient for present needs and those that will be created by the new plant. Mr. Brittain, who is to have charge of the construction, is head of the Mobile Shipbuilding Co., the Jacksonville Dry Dock & Repair Co., and is interested in the Terry Shipbuilding Co., Savannah, as well as in manufacturing plants in New Jersey and New York. He formerly resided in Birmingham but now lives in New York.

Navy Plans Elimination of the Middleman

Washington, July 2.—"Manufacturers were never held to a stricter accountability to the government than they have been since the entry of this country into the war," said Rear Admiral McGowan, paymaster and chief of the bureau of supplies and accounts, in outlining the navy department's policy of direct dealing with makers of supplies.

"The number of responsible direct bidders has greatly increased and at the same time the number of agents and intermediaries has been reduced to a minimum. The safeguards against profiteering have not been relaxed but strengthened."

Calling attention to the fact that there are now more than 14,000 firms on the bidders' list, and that they supply more than 60,000 items of material for the navy, Admiral McGowan said:

"In the purchase of supplies and materials the navy department has used every endeavor to eliminate the middlemen and to have manufacturers and dealers deal directly with the department. These efforts have been very successful, the number of those who transact business direct, without any intermediary, having about trebled in 18 months. In this way agents, brokers and commission men have been so largely eliminated that there are only a few concerns, and these seem to prefer to deal through such agents, who hold navy contracts who do not present their bids directly to the department."

The bureau of supplies and accounts rejects each month about 150 applications to be placed on the bidding list from concerns that cannot show they are manufacturers or dealers carrying in stock the articles they offer to supply.

Iron and Steel Exporting Obstacles Increase

New York, July 2.—The war trade board, in order to place all purchases of iron and steel for England, France, Italy and Belgium directly in the hands of the high commissions representing these coutries, has ruled that licenses issued prior to May 15 for iron and steel shipments to these countries will expire July 1. While this ruling is another blow to exporters, it is particularly mitigated by the fact that these commissions, to a growing extent, are relying upon exporters here, since the latter are more familiar with the sources of supply and the methods of doing business and of financing. Increasing difficulties are encountered in obtaining licenses for exporting iron and steel. For instance, exporters have been advised that licenses for sheets will not be renewed. Plates, shapes, tin plate, sheets, wire rope and some other products are most difficult to obtain licenses for, and particularly when they are of open-hearth steel. It is less difficult to obtain licenses for shell discard and bessemer steel. In fact, where the product is wanted for almost any purpose by any of our allies, licenses for bessemer steel are granted in practically all cases. Favorable priority numbers are being extended only to such export business as is directly a part of the allied war requirements.

Officers Are Elected

All the officers of the Alabama Coal Operators association were re-elected at the recent annual meeting. Reports indicated that the organization was in good shape and that the affairs were being well managed. The officers of the association are George B. McCormick, president Pratt Consolidated Coal Co., president; Charles F. DeBardeleben, vice president of the Alabama Fuel & Iron Co., vice president; James L. Davidson, secretary and treasurer. The executive committee follows: George Gordon Crawford, president Tennessee Coal, Iron & Railroad Co., chairman; J. B. McClary, president Yolande Coal & Coke Co.; Walter Moore, president Empire Coal Co.; A. H. Woodward, chairman of the executive board of the Woodward Iron Co., and George F. Peters, president Climax Coal Co., Maylene, Ala.

During the summer vacation period, 600 students from the Massachusetts Institute of Technology will work as ship fitters' helpers in the shipbuilding plants at Quincy, Mass., and Bath, Me.

More Light Shed on Priority System

Mills Expected to Accept Orders Not Accompanied by Certificates—Not All War Business Given Priority Rating—Officials Overwhelmed With Applications—Duties of the Steel Director Are More Clearly Defined

WASHINGTON, July 2.—Mills which accept orders for steel only when covered by priority certificates are not living up to the agreement ratified by the war industries board in the resolutions of June 6, according to interpretation officials of the board place upon this determination. The agreement, made with the board by the steel and steel products committee of the American Iron and Steel institute in behalf of the industry, calls for definite responsibility on the part of the manufacturers who, in demanding certificates, pass the burden on to the priorities committee of the board.

This responsibility unfortunately was not made clear in the resolutions because of error in their transcription, as stated in these pages last week. Some of the mills which missed the point and had notified customers they must present certificates before orders for steel would be accepted, have since withdrawn from this position and are now accepting allotments where the use is covered by the schedule of purposes outlined in the resolutions. Other mills are expected to follow this example.

The priorities committee has since prepared another letter to the trade, making the correction, and in addition giving a brief but full explanation of what is expected of the steel industry. This expectation, which is for full reception of the responsibility for steel manufactured without priority certificates, may seem a hardship by some manufacturers, especially in hewing to the line in deciding what is and what is not an essential purpose of steel, but some companies have accepted the opportunity to go on with customary production practice, arranging their programs for and interrupting them only when priority rating on certain orders require it.

Letter of the Committee

This letter provides for this in this way:

"The purpose of the resolutions is to permit deliveries of pig iron and of steel manufactured products under the schedule of purposes not only after orders covered by priority certificates shall have been filled, but at any time to the extent of such deliveries will not interfere with the filling when and as required of orders covered by priority certificates.

"If satisfactory delivery can be secured without specific priority directions on orders embraced within the schedule of purposes entitled to preference treatment, no application for a priority certificate need or should be made."

A steel manufacturer, in Washington to get a clearer idea of what the resolutions mean, said the second quoted paragraph reads like instructions only to steel consumers. For producers, he said, it should read: "If satisfactory delivery can be guaranteed without specific priority directions on orders embraced within the schedule of purposes entitled to preference treatment, no certificate of priority should be required."

The letter from which the two paragraphs above quoted are taken is in addition to the one carried in full in THE IRON TRADE REVIEW last week. Both letters cover these points, the second one more specifically, however. In addition to making the correction, it requests all outstanding copies of the resolutions be corrected accordingly. Maurice Hirsch, secretary of the committee, signed the first letter and Judge Edwin B. Parker, chairman, the second. The combination of the two, with the corrected resolutions, is believed by committee members to be sufficient in clearing for the industry any misunderstandings which have arisen.

Steel Director's Duties Defined

The letter from Secretary Hirsch made the statement that "allocation of steel is undertaken by the director of steel supply only with reference to direct government orders. All orders must be placed by the concern desiring steel". This statement more clearly defines the duties of J. Leonard Replogle, director of steel supply. Government steel includes tonnage for the allies, the army, the navy, the shipping board, the railroads and any other orders for which the American government accepts responsibility.

Steel deliveries today are approximately 85 to 90 per cent on government account. Of this huge quantity, approximately 50 per cent is covered by priority. This gives mills considerable leeway in producing the other 50 per cent, but Mr. Replogle, through the weekly and special reports on shipments from mills and furnaces, is keeping careful check on the purposes for which all steel is being manufactured and recalcitrant producers may find themselves asked to account for certain shipments. Commandeering powers may be administered jointly by the steel and the priorities divisions.

Through the letters sent out by the committee, the point is brought out that priority may cover any kind of an order for steel, although, as before stated, at present it represents about 50 per cent of the tonnage on the industry's books. Even the government, whose orders naturally are given preference with or without priority rating, does not demand priority for all its material. It does only when there is shortage of a particular product or when some emergency requires immediate use of the steel. There are thousands of tons on order for the United States and the allies which have no priority rating and are being manufactured daily without conflict with tonnages covered by certificate.

For a Flood of Certificates

The priority system provides a remedy in the event any mill suddenly becomes swamped with certificates and there is danger of conflict in gaging production. Should such occasion arise, the committee calls in the persons who applied for the certificates and representatives of the manufacturing company so swamped. Then the situation is fully discussed and those particular orders may be reclassified to meet their respective urgency and the economic convenience of the mill.

Another phase of the priority situation which steel consumers likely are to misunderstand and which steel manufacturers, in complying with the June 6 resolutions, will watch closely, is misuse of rating numbers placed on specific orders. Those numbers apply only to those particular orders. It is believed this misunderstanding occurs only in plants seeking steel with one order covered by priority or with several orders of the same classification. Members of the committee point out that very frequently materials covered by several priority classifications may be necessary to provide for one finished manufactured product.

As stated in the letter from Secre-

tary Hirsch, no plant is given a blanket priority rating. It has come to the attention of members of the board that some manufacturers have tried to get steel for nonwar orders by overstating the quantity required for a specific war order. This is a dangerous practice and steel manufacturers subscribing to the 100 per cent pledge and following the plan of the resolutions are not being caught through this misuse of priority classifications.

It has developed that nails do not require priority, whether for government or other purposes. One of the largest producers of tobacco in the country applied to the priorities division for certificate for delivery of a keg of cigar box nails. The nailmaker declined the order, worth about $12.50, without a certificate. Tobacco officials rushed to Washington at an expense of $40 to $50 and found that, for an order of such a size, priority certificate would not be needed. Still unable to get the nails without some kind of an order, the tobacco men and the priorities representatives sought out the nail manufacturer and between them it was agreed that tobacco comes under the classification of "food and collateral industries" under the general purposes list. Immediately after this incident, a company applied for priority for 800 kegs of nails. The application was returned with this note appended:

"Priority is not being administered on nails. Producers should consent to supply nails within reasonable limits."

Needless to say, both orders for nails will be filled.

An idea of how busy the priorities division of the board really is, comparison of a few figures will give an estimate. In the week ending June 14, 6523 individual applications reached the committee. That is an average of 1087 per day. The week's total had increased from 4722 the week before, which averaged 787 applications daily. In the week before, which was before the promulgation of the steel resolutions of June 6, the total applications numbered 2700, or 450 daily. Whether the entire increase was due to the practice of steelmakers in demanding priority certificates, when consideration of the preference list would have sufficed, has not been disclosed. It may be pointed out that when the committee adjourned for the week ending June 14, the pending applications numbered more than 5500.

Steel Company Profits Are Abnormal

—Federal Trade Commission

WASHINGTON, July 2.—The federal trade commission, acting on the senate's request for data and information on profiteering, which was prompted by the President's address of May 27, when he urged congress to go on with additional tax legislation, has submitted a report based on its investigation of steel, copper, nickel, zinc, coal, lumber and other commodity prices. The report says there is reason to believe that profiteering exists and that some of it has been due to "inordinate greed and barefaced fraud". The commission spares neither names nor figures in the compilation of the report and in submitting its data, places steel in the very first item.

Steel companies made abnormal profits in the period prior to the government price-fixing policy, and a number have continued to make unusually heavy profits since that policy was inaugurated, the commission declares, speaking through William B. Colver, chairman; John Franklin Fort, vice chairman, and Victor Murdock, a member. It charges that some companies, which recently complained that the government's prices are too low for them, have in almost every case enjoyed unusual returns. Even the less integrated companies have received substantial profits, the report declares.

These statements by the commission throw some light on the government's reticence in increasing steel prices. The commission's figures are at the disposal of the war industries board and its price-fixing committee. In fact, Chairman Colver of the commission, is a member of the price-fixing committee. It has been a long-recognized fact that the commission has been opposed to higher prices. It has urged abrogation of contracts and is largely responsible for the clause in all steel price announcements which requires that contracts shall be subject to revision to the price prevailing at time of delivery.

Information is Incomplete

The commission carefully calls to the senate's attention the fact that the information contained in the report "is by no means a complete catalog." The untold findings are left out, the commission intimates, because the senate did not give it sufficient time to say all it would like to have said. What the commission did say concerning steel, however, is as follows:

"In finding costs in this industry for the war industries board, the commission divided the steelmakers into four groups: (1) The fully integrated mills; (2) the mills which start with the manufacture of pig iron; (3) the mills that start with steel furnaces, and (4) the mills that make rolled products from purchased semifinished steel. The United States Steel Corp. is included in class one. Its profits expressed in terms of the total amount invested in the business shows net earnings as follows: 1912, 4.7 per cent; 1913, 5.7 per cent; 1914, 2.8 per cent; 1915, 5.2 per cent; 1916, 15.6 per cent; and 1917, 24.9 per cent. The figures, as to the net income of the Steel corporation as shown by the company for the years of 1912, 13, 14, 15, 16 and 17 before deducting federal income and excess profits tax in 1917 follows: 1912, $77,075,217; 1913, $105,320,691; 1914, $46,520,407; 1915, $97,967,969; 1916, $294,026,564; and 1917, $478,204,343. The federal income and excess profit taxes of the Steel corporation for 1917 were $233,465,435, which leaves for net income $244,738,908, of which about one-tenth was applicable to interest on bonds of the corporation and the rest available for dividends and surplus.

Shows Percentage of Profits

"From information in possession of the commission, mills in class two appear to have made heavy profits in 1917. Recently, mills in class three made objection that the government prices were too low for them. A special examination of their profits by the federal trade commission showed that in almost every case these objecting mills were enjoying unusual returns. The following table of percentage of returns of investment in 10 mills in class three will show the profits in 1917:

Company	Per Cent
Alan Wood Iron & Steel Co.	52.63
American Tube & Stamping Co.	78.92
Allegheny Steel Co.	40.03
Central Iron & Steel Co.	71.35
Eastern Steel Co.	30.24
Forged Steel Wheel Co.	107.49
Follansbee Bros.	112.48
Nagle Steel Co.	319.67
West Penn Steel Co.	159.01
West Leechburg Steel Co.	109.05

"Mills in class four, which buy the semifinished steel and convert it into the more highly developed steel products, have enjoyed substantial profits."

Information upon the present range of profits in various industries arises, the report says, from three activities: (1) Cost-finding by the commission for the war industries board, the food administration, the fuel administration and other executive departments; (2) industrial surveys undertaken at the direction of the President or upon the commission's own initiative; and (3) enforcement of the law against unfair methods of competition.

Fixed Prices Allow Big Margin

"The outstanding revelation which accompanies the work of cost-finding is the heavy profit made by the low-cost concern under a governmental fixed price for the whole country," the commission related. "The outstanding feature on the score of profit revealed in the regular work of the commission under the statute creating it and the Clayton act, is the trade tendency to increase and to maintain prices against the forces of competition.

"In summarizing, certain features appear which it is well to note. In the case of basic metals, as in steel, when the government announced a fixed price, it was made so high that it would insure and stimulate production. This has resulted in giving a wide range of profits. Under the device of cost plus a margin of profit, these profits are necessarily great in the case of the low cost mills. Thus while the market was prevented from running away, as it would have done undoubtedly if it had not been regulated by a fixed price, the stronger factors in the industry are further strengthened in their position and enriched by profits which are without precedent.

"The experience with steel, flour and coal shows that a high stimulating fixed price, while stabilizing an ascending market, produces an economic situation which is fraught with hardship to the consuming public and with ultimate peril to the high-cost companies through increasing the power of their low-cost competitors. In this connection a survey of the petroleum field shows that the market, when under the control of dominating factors, such as Standard Oil, can be one of huge profits without the device of the high fixed price.

Criticizes Big Salaries

"Payment of extraordinary salaries and in some instances bonuses to executives of corporations have been found by the commission during the investigations. An illuminating example of high remuneration, charged to the expense account, is that given by the American Metal Co., Ltd., New York, the chief dealings of which are in zinc. Another trade practice which has increased the price of supplies to the consumer had been that of commercial bribery, upon which subject this body recently addressed the congress, suggesting remedial legislation. Again, the trade tendency of manufacturers maintaining the resale price of wares, has contributed to holding high the general price level and in instances had increased profits without question."

The commission, in submitting the memoranda on the industries under consideration, expressed the opinion that general trade, as the commission has opportunity to view it, is in a "high state of prosperity".

In an hour of national service and self-sacrifice, the report declares, profiteering may be defined not only as the taking of an exorbitant profit, but should include a refusal to share in bearing the burdens of war in the form of a reduction in profits when they have been large in prewar times

Copper Industry Earnings Large

"Very large earnings have been made in the copper industry on the whole, although it should be noted that they have been due in part to an unusually heavy demand for this metal, which is used almost exclusively for war purposes directly and indirectly. The commission's figures show that 21 companies, including a large proportion of high-cost companies, made profits in 1917 which ranged from 1 per cent to 107 per cent on their investments. The average profit was 24.4 per cent. Probably more than 70 per cent of the production is marketed at profits in excess of 20 per cent on the investment. These same companies showed an average profit of only 11.7 per cent in 1913, which may be considered to be a normal year. The range of profits in 1913 was from 1 to 56 per cent. The profits used in these computations do not include federal income or excess profits taxes.

"There does not appear on the whole to have been any concerted action in this industry in putting prices up in the first instance. The war scramble among the allies shot the prices of copper and other metals to almost unheard of levels. But there are certain strong interests which predominate in certain stages of production, and these appear to have taken steps to maintain prices at unnecessarily high levels. In the first place, the smelters, and notably the American Smelting & Refining Co., have continued to hold in force certain deductions for risk of carrying copper brought from mines, which risks have ceased to exist. These deductions were put in force during the early period of the war, before price was fixed by agreement with the war industries board.

Pick Board For Gun Plant

WASHINGTON, July 1.—A board has been appointed to represent the ordnance department in the preparation of plans for the Neville island plant for heavy cannon and projectiles, to be built for the government by the United States Steel Corp. The members were selected by General C. C. Williams, acting chief of ordnance, because of their knowledge of the scientific and practical details of making gun forgings. The members are: Colonel Charles C. Jamieson, president; Colonel Charles M. Wesson, Lieutenant Colonel H. B. Hunt, Lieutenant Colonel W. P. Barba, Lieutenant Colonel F. E. Walters, Lieutenant Colonel R. P. Lamont and Major Charles A. Walker Jr.

Colonel Jamieson was in charge of manufacturing at Watervliet arsenal four and one-half years. Colonel Wesson was formerly at Watervliet and is now in command at Watertown arsenal. He is a steel expert of considerable experience. Colonel Hunt has had a long contact with large manufacturing enterprises, and Lieutenant Colonel Barba was for 37 years associated with the Midvale Steel Co., Philadelphia, rising from messenger boy to vice president and general manager. Colonel Walters is a construction engineer of wide experience and will be in charge of planning and building construction. Colonel Lamont is president of the American Steel Foundries. Major Walker has been at the Watervliet arsenal four years as superintendent of plant.

Maj. A. B. Hubard, formerly ordnance engineer of the Midvale Steel Co., will be called upon by the board for work in connection with the selection of machine tool equipment and machine operation.

An appropriation of $40,000,000 was allowed for the plant. The plans are now well advanced and purchase of equipment has begun.

Iron and Steel Men in War Machine

F. J. Hall, Plate Section Chief, Institute's Subcommittee on Steel Distribution

FRANCIS J. HALL was the man selected to represent the manufacturers of steel plates on the American Iron and Steel institute's subcommittee on steel distribution. When the extent of the country's effort to establish adequate shipping to meet war times is considered the great importance of the services being rendered by Mr. Hall may be accurately measured. Troop ships, merchant ships, submarines and submarine destroyers are included in the term "shipping". Another large field in the intense present demand for plates is the railroad carbuilding industry. Plates likewise are needed largely in the construction of the famous "caterpillar" tanks, which again have figured prominently in the war dispatches and for many other essential purposes. Mr. Hall's responsibilities and activities in seeing that all these demands are filled, consequently have been varied and numerous, since his task is that of allocating orders for all government plate needs. He is one of James B. Bonner's right hand men at Washington. Mr. Bonner is vice chairman of the committee of which James A. Farrell serves as chairman. Mr. Hall is constantly on the job, visiting plate mills throughout the country. Today as a result, he is regarded as one of the country's best informed men on the plate situation. As vice president of the Central Iron & Steel Co., Harrisburg, Pa., Mr. Hall little thought he was being fitted for one of the big war-time jobs. He became affiliated with that company on Dec. 1, 1902, and through successive promotions, he finally became its vice president. For a while, he served as general sales agent.

While it is not an official statement, it is generally conceded that Mr. Hall's findings on the plate situation had much to do with the elimination of Chicago as a basing point on that product, just ordered by the President, if not also on shapes and bars. Mr. Hall has attended practically all of the price-fixing conferences between the producers and the war industries board and was present at the latest which was held Friday, June 21.

Mr. Bonner leaves plate matters in Mr. Hall's hands and the latter is given practically a free rein in this work. Mr. Hall's duties keep him constantly in touch with the war program and since plates come in for a large measure of consideration, he sits in on tonnage questions affecting plates at the steel section. He is a native of Harrisburg, Pa., having been born there, April 1, 1878. He has been greatly interested in civic affairs, is manager of that city's hospital and is a trustee of its board of trade. He is a member of the Harrisburg club, the County Club of Harrisburg, the Ivy Club of Princeton, of which he is a graduate, and the Masonic fraternity. He also is a member of the American Iron and Steel institute. He serves on the Central Iron & Steel Co.'s board of directors. When the company was established in 1853, its annual output of plates was 1000 tons. This has steadily increased until now, the annual tonnage is about 200,000. This will doubtless be increased this year. In June, 1917, a receivership which had been in force since 1912, was lifted through Mr. Hall's efforts.

FRANCIS JORDAN HALL

Men of Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

A. B. COLE has been appointed assistant manager, publicity department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., to succeed M. C. Turpin, who has accepted a position in the ordnance department at Washington. Mr. Cole will have charge of the editorial work, including the preparation of literature, and supplying information to the press. He started his business career as general car-shop laborer for the Grand Rapids, Grand Haven & Muskegon railway, Fruitport, Mich., with the idea of obtaining a working knowledge of electric railway operation. In June, 1909, he was graduated from the school of electrical engineering, Purdue university, Lafayette, Ind., where he had made a specialty of steam and electric railway studies. On July 15, 1909, he entered the engineering apprenticeship course of the Westinghouse company and completed this work. Feb. 6, 1911. While on the course he was engaged, in addition to the regular shop testing, on railway project work in the general engineering division and as a railway sales correspondent at East Pittsburgh and afterward in the Cincinnati district office. In November, 1912, Mr. Cole was transferred to the publicity department to prepare railway publications and a year later was placed in charge of railway and large power apparatus publicity. Later he was given charge of railway, power, marine and R. D. Nuttall Co. publicity, which position he held up until the time of his appointment as assistant to manager. Recently Mr. Cole has been co-operating on publicity matters with the American Electric Railway association war board at Washington, spending half of his time in Washington, and the remainder in East Pittsburgh.

C. H. Overkamp, manager for Manning, Maxwell & Moore, Inc., on the Pacific coast, recently paid a visit to the company's New York office.

Henry C. Du Bois of E. J. Lavino & Co., Philadelphia, was recently appointed a member of the explosives and chemicals division of the war industries board.

Samuel W. Davis has resigned as vice president of the Bridgeport Trust Co., Bridgeport, Conn., to accept a position with the Bullard Machine Tool Co. in that city.

Ellsworth L. Mills was recently appointed sales manager of the railroad and apparatus departments of the Air Reduction Sales Co., with headquarters at 120 Broadway, New York.

C. E. Carpenter, vice president and general European manager of the Allied Machinery Co. of America, has been granted a captain's commission in the United States quartermaster's department in France.

Arthur B. Babbitt on July 1 became general manager of the Kent Machine Co., Kent, O. He formerly was head of the drawing and designing departments of the Wentworth institute, Boston.

D. P. Brown has been placed in charge of the Rochester, N. Y., office of the Hendey Machine Co., Torrington, Conn. He formerly was affiliated with the Bryant Chucking Grinder Co., Detroit.

S. R. Hunter resigned his position with the Fairbanks-Morse Mfg. Co., Beloit, Wis., as superintendent of the gas engine department to accept the position of production superintendent of the American Rolling Mill Co., Middletown, O.

Joseph Crawford Jr. has been elected president of the recently organized Crawford Machine Tool Co., Inc., Erie, Pa. Alexander Chessin was made secretary and treasurer. A sales office will be conducted at 21 Park Row, New York.

G. W. Long has been placed in charge of the Detroit office of the Simmons Machine Co., Albany, N. Y., located at 804 Dime Bank building. E. Hallman will represent the company in San Francisco territory with headquarters at 316 Rialto building.

W. A. Haines has been appointed district representative at Detroit for the Westinghouse Electric & Mfg. Co., East Pittsburgh. He will sell automobile equipment to the automobile manufacturers in that territory.

Frank Wollaeger Jr., secretary of the Kempsmith Mfg. Co., Milwaukee, who enlisted in the Milwaukee base hospital unit, has been transferred to the ordnance department. He now is at Camp Hancock, Augusta, Ga., taking special training for his work in this department.

A. Niedermeyer, who for many years has been connected with the Worthington Pump & Machinery Corp., New York, most recently as works manager of the Snow-Holly works at Buffalo, resigned on May 31 to devote his entire time to enterprises of his own.

Dr. Ira N. Hollis, president of Worcester Polytechnic institute, Worcester, Mass., and last year's president of the American Society of Mechanical Engineers, recently was elected an overseer of Harvard college, Cambridge, Mass., for a three-year term.

Aldus C. Higgins, secretary and general counsel of the Norton Co., Worcester, Mass., has been elected chairman of the New England section on industrial training for war emergency, which will work under the direction of the council of national defense.

E. C. Angell, vice president of the Wm. F. Davis Machine Tool Co., Inc., New York, Chicago and Cleveland, has been placed in charge of the company's Washington office, located at 945 Pennsylvania avenue. C. W. Bonfield has been appointed his assistant.

John G. Pew became vice president and general manager of the Sun Shipbuilding Co., Philadelphia, upon his recent resignation as president of the Peoples Natural Gas Co., and Home Natural Gas Co., Pitsburgh. He served the companies for 32 years and a farewell banquet was tendered him in Pittsburgh recently by 75 employes.

R. M. Rush was elected president of the recently incorporated Rush Machinery Co., 932 Oliver building, Pittsburgh. Other officers were elected as follows: Vice president, George B. Page; secretary and treasurer, J. H. Rush. The company is selling representative for the Kerr Turbine Co., Wellsville, N. Y.: the Thwing Instrument Co., Philadelphia, and the Torchweld Equipment Co., Chicago.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

CHARLES EUGENE SCHNEIDER, who was elected president of the Iron and Steel institute at its annual meeting held in London in May, was born at Le Creusot, France, in 1868. For several generations his family has been prominently connected with the iron industry of that country. His grandfather, Joseph E. Schneider, was the owner of the Bazeilles iron works at the beginning of the nineteenth century.

About that time he purchased the royal foundry of Le Creusot, established in 1782. He was the founder of the present form and the ownership of the works descended to his son, Herni Schneider, who died in 1898, having made the Schneider works world famous. At the age of 21, the latter's son, Charles Eugene Schneider, entered the works and became a partner. Upon his father's death, he assumed entire control and management. Further rapid expansion took place under his direction. He also took an active part in the development of the ore mining industry in the Briey district. When the war came and the major portion of the French iron and coal mining industries were paralyzed by the first invasion of the enemy, Mr. Schneider, with his customary energy, engaged in the work of reorganization, and by his unremitting efforts, has built new iron works and brought old ones into activity in other parts of France, which compensates largely for the loss of those works in the occupied provinces.

Mr. Schneider succeeds William Beardmore, who was elected president of the Iron and Steel institute in 1916. Mr. Beardmore joined the society in 1878, was elected a member of the council in 1891 and became vice president in 1905. He began his business career when he entered the Parkhead Forge as an apprentice, 14 years old. He became familiar with operations in every department. He studied practical science at Glasgow during his spare time and later took a course at the Royal school of mines at South Kensington, England. He later returned to Parkhead as assistant manager and then was made manager of the establishment. Under his management it has developed into a gigantic industry. Operating chiefly on material for ships and general work, Mr. Beardmore introduced the manufacture of armor plate, employing his own process. The firm supplied armor plate for numerous ships in the British fleet as well as for many in navies of other countries. In 1904, Mr. Beardmore acquired the ship plate and engineering business of Robert Napier & Sons, at Govan, which was later transferred to Dalmuir. This is now known as the naval construction works of William Beardmore & Co., Ltd.

Nicholas E. Palmer, for many years president of the Quintard Iron Works, has been elected a director of the Todd Shipyards Corp., New York.

Henry E. DuBois of the E. G. Lavinno & Co., Philadelphia, has been appointed a member of the explosive and chemical division of the war industries board.

George W. Moore, Webb City, Mo., has resigned his position with the American Metal Co., and on July 1 became the buyer in that district for the Eagle-Picher Lead Co.

Frank B. Bumgardner has been elected general manager of the Fort Smith Metal Products Co., Fort Smith, Ark., succeeding Albert Mitchell, who has been called to the army.

W. R. Davis, manager of the Success Zinc Co., Joplin, Mo., has been commissioned to raise a company of mining engineers and mining men from this district to become a unit in the Twenty-seventh Engineers.

W. T. Smith has been made president of the Chester Shipbuilding Co., Chester, Pa. L. T. Kniskern, superintendent of construction, now is general manager; W. J. Lippincott, his chief clerk, is office manager.

J. H. Harvey, Milwaukee, was recently made manager of the Ohio Steel Foundry Co., Springfield, O., to succeed W. J. Nugent, who resigned to become affiliated with the Electric Steel Co., Chicago.

Charles B. Seem, formerly affiliated with Perin & Marshall, New York City, consulting engineers, has become actively identified with the Electric Furnace Co., Alliance, O., as sales engineer.

Charles W. Burrows, Ph.D., former chief of the magnetic section of the national bureau of standards, has opened a laboratory as a magnetic-research engineer at Grasmere, borough of Richmond, New York City.

Fred A. Ballin was elected president of the Supple-Ballin Shipbuilding Corp., Portland, Oreg., upon the retirement of Joseph Supple as president. Mr. Ballin has been serving the company as secretary and treasurer.

Frederick W. Heiser recently resigned as assistant superintendent of the Zanesville Malleable Foundry Co., Zanesville, O., to become superintendent of the Canton, O., malleable foundry of the Timken-Detroit Axle Co.

David Hollywood, formerly general manager of the Ames Shipbuilding & Drydock Co., Seattle, and latterly with an Oakland, Cal., concern, has been appointed works manager of the new Southwestern Shipbuilding Co., San Pedro, Cal.

H. J. Pritchard, treasurer and director of the National Conduit & Cable Co., Inc., has been elected first vice president of the company and placed in charge of operations. He is now virtually acting president, succeeding the late George J. Jackson.

V. F. Milton has resigned as superintendent of the Fort Smith Smelter Co., South Fort Smith, Ark., and will be succeeded by Peter Schonaerts, of Checotah, Okla. The new superintendent is a brother of Adolph Schonaerts, superintendent of the Athletic Mining & Smelter Co.'s smelter at South Fort Smith.

W. W. Coleman, president of the Bucyrus Co., Milwaukee, Wis., has been designated to assist a group of expert advisers in the ordnance department in bringing about a maximum production of guns, gun carriages and munitions. Mr. Coleman will specialize in the production of guns of all calibers and of gun carriages. He will be associated with A. L. Humphrey, president of the Westinghouse Airbrake Co., Pittsburgh, in this phase of the work.

Demand Agitators' Arrest As Spies

Labor Leaders' Professed Control of Workers Questioned as German Sympathizers Are Suspected of Being at Root of Many Strikes—Federal Mediators' Pleas Ignored While War Production is Held Up

THE "pay" in the patriotism of certain classes of labor, which in many instances is halting war work until demands for more wages have been met, continues one of the most perplexing problems for employers and government boards interested in intensified production. Labor troubles have been so widespread and urgent requests that employes remain at work pending adjustments have been so flagrantly ignored that attorneys for manufacturers are studying the recent amendment to the espionage act to determine whether it covers cases where production is curtailed by the activity of agitators who may be secretly serving in Germany's interests. Suspicion along these lines has been particularly strong in the Cincinnati district where socialists and German sympathizers are believed to be operating under the cloak of unionism so that they may set up the defense that their intent is to improve working conditions. So many strikes and violations of bona fide contracts have occurred in some districts there is a strong sentiment developing in favor of taking the public protestations of good faith made by labor leaders "with a grain of salt". Records from the leading manufacturing districts of the country indicate that many labor leaders do not possess the measure of control they profess to exercise over their unions.

Everywhere the demand grows more insistent for more drastic federal regulations which will prevent agitators with ulterior motives fomenting strikes to hamper government operations. Co-incident with the strike of machinists and toolmakers at the three plants of the Curtiss Aeroplane & Motor Corp., two employes in the plant at Hammondsport were arrested by government agents charged with willful injury or destruction of war material, the specific offense charged being the concealing of cracks in aluminum crank cases. The strike was called off pending mediation by government conciliators and an investigation is in progress to determine the extent of sinister operations in the plant. The threatened strike of 21,000 workers at the plant of the General Electric Co., Schenectady, was averted by employers and employes agreeing to submit their differences to the national war labor board. In dozens of other cases, relatively small but collectively important, no thought was given to the probability of equitable adjustment through federal mediation. The employes arbitrarily quit, this situation giving rise to a general demand for some sort of government regulation making it compulsory for men to submit their grievances to mediators before striking.

The decision of employers in many districts not to advertise in local papers for help is reported as having had a decidedly beneficial result in reducing the labor turnover. The United States employment service has called on all war industries to estimate their common labor needs for the next three months and has begun a national survey to ascertain the common labor reserves of every state.

PATTERNMAKERS employed in jobbing shops in Cincinnati, all ding business as open shops, have demanded 75 cents an hour minimum, a 44-hour week and double time for overtime. A few days previous patternmakers employed in Hamilton, O., made similar demands and are now out on strike. Just prior to the action in Hamilton, the wood patternmakers in Columbus made the same demands and threatened to strike.

This unusual conditions in job pattern shops is said to have been brought about by the decision of Major James Tole, ordnance department, who early in May of this year settled the impending labor trouble in pattern shops in Dayton by awarding the patternmakers 75 cents an hour, a 44-hour week and double time for overtime. In Dayton 60 patternmakers were affected, all engaged on important war work. The effect of Major Tole's decision in Dayton is that 60 patternmakers are now working 44 hours a week, while previously they were working more than 52 hours a week, a net loss of production of 480 hours a week, because employers say they cannot afford to pay $1.50 an hour for overtime.

Besides the difficulties in the pattern shops of Cincinnati, 16 machinists employed by the Ruthman Machine Co. went on strike, demanding an increase in wages, an 8-hour day and recognition of the union. The strike is still pending. Sixty drivers for department stores, who rejected an award of higher wages made by a government mediator, are also on strike. Twenty-five drivers employed by the Cincinnati Railroad Omnibus Co., and 25 employed by the Finnstein Taxicab Co., went on strike, violating contracts with their employers. The former company granted the demand for more wages and the strike was settled. The other strike is pending.

The puddling plant and plate mill of the A. M. Byers Co., at Girard, O., are closed, operatives having again demanded that the company recognize the union. The company declined to do this, as it did a year ago when a federal labor conciliator held that the men had a right to organize but did not insist on the company recognizing the union. The case is again in the hands of federal conciliators. About 500 puddle plant operatives and about 100 plate mill employes are affected. Neither wages nor working conditions are involved in the dispute.

* * *

THE recent labor troubles at the plants of the St. Louis Screw Co., Wagner Electric Mfg. Co. and the Koken Barbers' Supply Co., St. Louis, have been overcome. Production is going on at a rate satisfactory to all of these concerns. At the Commonwealth Steel Co.'s plant, Granite City, the patternmakers walked out

a few days ago, demanding an increase from 70 cents an hour to 85 cents an hour. The company offered 75 cents but the offer was rejected. It is reported that the war labor board wired the patternmakers' union to have the men return and remain at work pending the establishment of a standard rate for the St. Louis district by the national war labor policies board.

The machinists in the St. Louis district also put in a request for 90 cents an hour. The company had established on June 1 a rate of 65 cents an hour for machinists. Negotiations between the men and the company are now in progress. The stand taken by the war labor board in the case of the patternmakers may prevent the machinists from going on strike if their demands are not fully met.

* * *

WHILE an effort has been made by labor leaders to stir up trouble in Indianapolis no serious results have followed. In several instances government representatives were sent for by the unions. Fifty metal trade firms have organized an employment managers' association to reduce labor turnover.

Boston foundrymen have heard whispers for the past 10 days of wage dissatisfaction among the molders, and it is believed the situation will come to a head within a short time. Molders now receive $5.25 a day and they want an increase to $5.80 or $6. No formal demand will be made until the union has debated the question.

In the Springfield, Mass., district the labor conditions are unchanged and running smothly except at the Smith & Wesson shop, where demands for a closed shop have been made by the union. This shop has always been open and it is evident the union regards this as a favorable time to organize the employes. From 400 to 500 men are out.

The Rhode Island district reports general unrest, rumors of demands, but nothing tangible..

The New Departure Mfg. Co., Bristol, Conn., on June 29 paid employes who had been in its service for six months a bonus of a full week's pay, and those in its employ from three to six months a bonus of a half-week's pay. Nearly 2000 employes benefitel.

In the Utica, N. Y. district the strike which had been pending at the Bossert Corp. since last August was declared off by the union. The organizer who caused the strike was reduced to the ranks and left the territory. A new organizer has arrived from the Pacific coast, but has not staged anything up to the present. At the Hart & Crouse Co.'s plant 120 molders and coremakers are still out, but the plant is operating.

* * *

DURING the past two weeks no unusual labor difficulties have developed in the Chicago district. Ever present scarcity of skilled mechanics is particularly emphasized and also the great scarcity of common and unskilled help. On several occasions assaults have been made by strikers on employes of the Mark Mfg. Co., Evanston, but precautionary measures have now been taken.

Kenosha, Wis., reports all classes of labor are receiving high wages, but the turnover continues to be large as operatives will not stick to their jobs.

* * *

REFUSING to heed the plea of Secretary of War Baker, 1000 machinists in six plants in Bridgeport, Conn., went on strike June 26. They had hoped to walk out 6000 strong, but 5000 considered their grounds too weak for holding up war work. The strikers served notice that they woud quit if the manufacturers did not accept the wage decision of the control bureau of the ordnance department, presented June 8. Secretary Baker made a special plea to the men, advising them that the decision of the control board was not final and that it was subject to review by the Taft-Walsh board. Despite this, the instigators of the strike succeeded in crippling the work for three days when they were given assurance that the decision of the Taft-Walsh board would be final and enforced by the government. The manufacturers had announced they would abide by the decision of the board.

An interesting sidelight on the labor situation in the Bridgeport district is the fact that manufacturers have been unable to obtain enough women for certain lines of work to take the places of men who have been drafted. Labor is so scarce that some shops are resorting to the old system whereby one good mechanic is used with boys or unskilled help, the expert acting as teacher and supervisor.

Puddlers Receive Advance

Another increase has been granted to puddlers affiliated with the Amalgamated Association of Iron, Steel and Tin Workers. At the meeting held at Atlantic City, July 1, the regular bimonthly wage settlement was effected between that organization and the Western Bar Iron association. This showed a card rate of $3.35 as against $3.30 for March and April. The boiling rate is advanced thereby, from $16.05 to $13.60 per ton and the wages of finishing mill hands correspondingly. The comparative bimonthly bar iron average price per pound since January, 1917, and the resultant puddling rate are as follows:

		1918		1917
Jan.-Feb.	2.35c	$11.30	3.10c	$15.05
Mar.-Apr.	2.45c	11.80	3.30c	16.05
May-June	2.65c	12.80	3.35c	16.30
July-Aug.	2.75c	13.30	.....	.....
Sept.-Oct.	2.85c	13.80	.....	.....
Nov.-Dec.	2.95c	14.30	.....	.....

It will be noted that the rise has been constant with each period of two months since January, 1917. The new rate of $16.30 is but 75 cents under the maximum with the bar iron price fixed at $3.50 by the government.

The bar iron wage scale for the year commencing June 30 was signed substantially on last year's basis on July 1, after a conference at Atlantic City, which began June 25.

Tinhouse Wages Increased

Wage advances for tinhouse employes were agreed upon at the annual conference between tinplate manufacturers and the Amalgamated Association of Iron, Steel and Tin Workers, meeting in Atlantic City, N. J. These increases range from 3 to 10 per cent for the scale year, commencing July 1. Tinhouse workers number approximately 10 per cent of the men employed by the industry. At the sheet session, minor concessions were made to sheet mill workmen. These concessions, however, according to representatives of the mill interests, do not affect the base wage rate or mill operating costs to any appreciable extent. An agreement was reached that the Fourth of July, Labor day and Christmas holidays should be recognized as holidays, with 24-hour mill suspensions. Section 13 of the scale providing "two men on a 55-pound bar and heavier, any width, doubled", has been amended by substituting "not finished off" for "doubled". The bar iron conference opened June 25 and is now in session.

Gun Plant to Close

The Smith & Wesson Associates, Springfield, Mass., has decided to close its plant if the 1500 employes strike to enforce the adoption by the corporation of a new schedule of wages. The factory will be closed until the employes agree to present their demands as individuals, or until the corporation can secure other help. Fully 1000 employes have signed a petition demanding a 25 per cent increase in wages and asking it to furnish oil, drills, and waste and for other changes in working conditions. The factory is on war orders and unless the trouble is settled soon the government may take charge.

Inaugurate New War Organizations

Resources and Conversion Section of the War Industries Board Starts New Localized Manufacturers Groups to Further Co-operation Between Producers and the Government—Quick Production, Chief Aim

PROCEEDING along the lines set forth in THE IRON TRADE REVIEW of June 6, the resources and conversion section of the war industries board is organizing the entire manufacturing facilities of the country for war production. Charles A. Otis, who was appointed as head of the section, recently announced the geographical division of the country into 20 distinct regions. The boundries of these respective regions are shown in the accompanying map. In each of these regions a representative was chosen by Mr. Otis to place the plan before the manufacturers in order that an organization similar to that already formed in the Cleveland district might be set up. A commissioner is then to be appointed in each district on recommendation. This commissioner is to represent the resources and conversion section.

Action is now being taken toward building up these 20 organizations. In the appointed centers meetings called by the presidents of the various chambers of commerce, who were appointed by Mr. Otis, are now working out detailed organizations which will act as a localized connecting link between the government and the manufacturer. In this connection a meeting of 400 manufacturers was held in Pittsburgh June 26. President George S. Oliver of the chamber of commerce, was made commissioner of the region, and he appointed an advisory board. Robert Garland was named business manager. The headquarters of the new organization, which is called the war resources committee of Pittsburgh, region No. 5, has been opened with Mr. Garland in charge.

Subdividing the Regions

The Pittsburgh region, following the procedure in the Cleveland region, was divided into a number of smaller divisions composed of a number of counties in each. These divisions take the names of the larger towns in which the divisional headquarters will be established. Those under the Pittsburgh region are Pittsburgh, New Castle, Oil City, Johnstown and Altoona, Pa.; Cumberland, Md.; Fairmont, Wheeling, Parkersburg, Clarksburg and Huntington, W. Va.

The commissioner will represent the government in dealing with manufacturers seeking or willing to accept orders for war materials. The advisory board will assist by giving attention to the many details in bringing the manufacturers and the government together. It is the intention of the organization to increase production, to prevent dislocation of labor, to fill contracts quickly, to avoid the complication of the housing problem, to afford concerns having facilities for government work easy and direct means of securing it and generally to do all those things which will enable industry to give the greatest and speediest aid in the winning of the war.

"The government," Mr. Garland said in his remarks at the meeting, "believes that it is best that one plant should not have a large contract on hand for six months. The better way is to divide it among 10 plants and get the work done in 30 days."

Orders Will be Distributed

Illustrating his point, Mr. Garland said that in such a matter as the making of 1,000,000 castings, when the plan is fully under way, the country will be surveyed and each region given a part of the job in proportion to its producing capacity. An important result of this plan will be to prevent the removal of labor from one district where there is no government work going on to another where it is being done, with consequent distressing congestion in some localities and the ruin of business in others. The government does not desire to promote the construction of new plants and equipment where there is equipment in existence which can do the work.

Manufacturers present asked questions regarding the practical operation of the plan in obtaining government orders. It was stated in reply to one question that the furnishing of railroad equipment, such as steel cars, would be in general outside the regional plan. Inquiry was made with relation to the fate of the present practice of obtaining orders through organizations of manufacturers in the same line, and it was stated that while it will continue for some time, Mr. Otis is of the opinion that it will in time be superseded by the regional method.

The following were selected as members of the advisory board: George L. Brown, the Marshall Foundry Co.; W. G. Costin, Pittsburgh Screw & Bolt Co.; A. V. Davis, president Aluminum Co. of America; James L. Foster, General Chemical Co.; Roland Gerry, Jones & Laughlin Steel Co.; A. M. Harper, Carnegie Steel Co.; Pennock Hart, Mackintosh-Hamphill Co.; John W. Hubbard, Hubbard & Co.; Frank J. Lanahan, president Fort Co.; F. J. Kress, F. J. Kress Box Pitt Malleable Iron Co.; A. C. Lehman, Blaw-Knox Co.; F. H. Lloyd, Pittsburgh Dry Goods Co.; W. H. Schoen, Edgewater Steel Co. and Keystone Bronze Co.; Hamilton Stewart, Harbison-Walker Co.

Other Districts Organize

In this region, as well as in the other 19 throughout the country, the more intimate details of organization within the subdivisions are being handled through meetings of the manufacturers. An example of this procedure is furnished by a meeting which was held in Youngstown last week at the call of W. H. Foster, General Fireproofing Co. At this meeting, James H. Foster, Hydraulic Pressed Steel Co., Cleveland, who is the head of the Cleveland region war industries commission, outlined the organization plan, and the counties of Mahoning, Trumbull and Columbiana, Ohio, and Mercer county, Pennsylvania, effected a working body of which H. E. Herrod, secretary of the Mahoning Valley Employers' association, was chosen vice president, and H. A. Boyd, an employe of the same association, was made secretary. W. H. Foster was elected permanent head of the Youngstown subregion.

The second region, of which Bridgeport, Conn., is the center, has chosen as commissioner Bradford D. Pierce Jr., president of the chamber of commerce. The heads of the six subregions named are: C. E. Bilton, president Bridgeport Manufacturers' association; Isaac M. Ullman, president New Haven chamber of commerce; Charles L. Taylor, chairman manufacturers' committee, Connecticut Manufacturers' association; C. C. Peek, president New London chamber of commerce; Wil-

liam H. Stuart, president Springfield chamber of commerce, and Allen H. Bagg, persident Pittsfield board of trade.

The eighth region, of which Detroit is the central city, has been organized into 13 subregions under A. A. Templeton, who was appointed by Mr. Otis. The heads of these respective subregions are: M. J. Murphy, Detroit; Charles W. Haensel, Port Huron; G. T. Kirby, Saginaw; D. A. Reid, Flint; L. C. Howlett, Bay City; W. M. Comstock, Alpena; A. B. Kleise, Petoskey; E. N. Turner, Manistee; J. E. A. Johnson, Muskegon; Dudley E. Waters, Grand Rapids; Clarence E. Bement, Lansing; C. F. Holland, Jackson, and A. C. Barley.

Truman H. Aldrich, a well known industrial leader of the Brimingham, Ala., district, has been appointed director of Zone No. 13. Robert Jemison Sr., who was first chosen, could not accept upon advice of physicians. Mr. Aldrich has been in the Birmingham district many years. He has consulted with the manufacturers in the immediate Birmingham territory, and has called conferences with manufacturers from other parts of the district in order to complete the organization and lay out plans for the administration of the system.

Water System Deferred

Boston's high pressure water system, which has been in process of construction now for more than six years and is still uncompleted, and which has been the cause of much annoyance to down-town business men and to insurance people, because its completion would have materially reduced the fire risk in the congested business district, will not be completed until the war is over. Some 7 miles of underground pipeage has been installed and also the hydrants, but 5 or 6 miles more of line and a central pumping station are necessary to complete the system. And for this important work there remains only $190,000 of an original appropriation of $1,000,000. It is estimated that to complete the work, there would be required at least $500,000 in addition to what is available from the first appropriation.

Stoker Makers Offer Aid to the Government

All the resources of the Stoker Manufacturers' association, organized at Pittsburgh June 26, have been tendered to the government. Resolutions pledging loyalty and co-operation were forwarded to B. M. Baruch, chairman of the war industries board, and Fuel Administrator Garfield. The following officers were elected: P. Albert Pottenhausen, Chicago, president; W. F. Sauter, president of the American Engineering Co., Philadelphia, vice president; Joseph Harrington, Chicago, secretary-treasurer.

The following stoker manufacturers were represented at the meeting: American Engineering Co., Philadelphia; James A. Brady Foundry Co., Chicago; Burke Furnace Co., Chicago; Detroit Stoker Co., Detroit; Green Engineering Co., East Chicago, Ind.; Lehigh Stoker Co., Allentown, Pa.; Murphy Iron Works, Detroit; M. A. Hofft Co., Indianapolis; Sanford Riley Stoker Co., New York; Twin Fire Furnace Co., Chicago; Underfeed Stoker Co. of America, Chicago; Westinghouse Electric & Mfg. Co., Pittsburgh; Wetzel Mechanical Stoker Co., New York.

New Shipyards

At Halifax to Cost $3,750,000—Three Keels to be Laid by Fall

Toronto, Ont., July 1.—James Carruthers and J. W. Norcross, Montreal, and M. J. Haney, Toronto, who represent the leading interest in Halifax Shipbuilders, Ltd., are in Halifax inspecting the drydock and shipyard site and arranging for extensions and improvements. J. W. Norcross, president of the company, announced that work will begin next week if engineers' plans are completed, and that keels for three 10,000-ton freighters would be laid within three months. The expenditure on the plant will be between $3,750,000 and $4,000,000.

The Wentworth Mfg. Co., a new organization capitalized at $300,000, will take over the plant of the Wentworth Brass Co., Hamilton. It will manufacture airplane bolts and nickel-steel screws for war purposes, and subsequently will undertake the production of electric fixtures and brass goods. J. J. Noll is manager and William Beattie, superintendent.

To Make Tool Steel

The LeMoyne Steel Co. has been organized to make high speed tool steel and alloy steel and will offer its products in the market soon. The company has taken over the plant of the Robinson Machine Co., at Monongahela City, Pa., and is installing a 2-ton heroult electric furnace. H. A. Kuhn is president, S. A. Davis is secretary and treasurer and E. W. Strong is manager of sales. Mr. Strong formerly was connected with the American Vanadium Co.

Inspection Tour

Made by Publishers and Allied Manufacturers' Representatives

Steps toward establishing greater efficiency through co-operation between publisher and manufacturer resulted from the "preparedness inspection tour" made by representatives of leading trade publications and the Allied Construction Machinery Corp., June 17-28. Opportunities for a clearer and more concise understanding of each other's viewpoint were manifold and resulted in the frank interchange of ideas and plans.

The tour was made under the auspices of the Allied corporation formed by a group of noncompeting manufacturers of construction machinery for the handling of their export sales. The manufacturers thus represented included: The Lakewood Engineering Co., Cleveland; the Thew Automatic Shovel Co., Lorain; the Parsons Co., Newton, Iowa; the Hydraulic Pressed Steel Co., Cleveland; the Clyde Iron Works, Duluth; the C. H. & E. Mfg. Co., Milwaukee; Sterling Wheelbarrow Co., West Allis, Wis.; Barber-Greene Co., Aurora, Ill.; the Western Wheeled Scraper Co., Aurora, Ill.; the Austin Mfg. Co., Chicago.

The publishers and manufacturers met in Chicago, June 17, and at a "preparedness luncheon" discussed manufacturers' problems and the publishers' ability to serve. The subjects were gone into more thoroughly at a meeting the following day when every detail of the manufacturers' plans was studied. A more comprehensive idea pertaining to capacity and a direct line of contact between publisher and manufacturers were established. Leaving Chicago Wednesday, the delegates went to Aurora, where they visited the plants of the Western Wheeled Scraper Co., and the Barber-Greene Co. Thursday they visited the Clyde Iron Works, Duluth. The trip next took them to Newton, Iowa, thence to Milwaukee, returning to Chicago, Tuesday, June 25. Wednesday and Thursday were devoted to inspecting plants in Cleveland and Lorain, the tour ending Friday with a meeting at the Cleveland Athletic club's headquarters.

To Install Furnace

The Atlantic Foundry Co., Akron, O., is having installed in its new building a 3-ton Snyder electric furnace. The furnace is three-phase and is built for acid operation on general steel casting work.

Iron and Steel Financial News

Up-to-the-Minute Fact and Comment Collected and Sifted For Busy Readers

Washington Dominates Business Policy

WALL street looks to Washington and to Europe for most of the news having any bearing on the stock market. It is at Washington where the momentous financial transactions now are negotiated. Washington is the heart of the biggest buying organization the world has ever seen, an organization whose demands are responsible for turning most of the wheels of industry today. When the government borrows, Wall street watches closely the details of terms and amounts. When the government spends, Wall street watches the order go to this or that company with only casual interest, for war orders have become commonplace and, as they are placed nowadays, with fixed prices and specified margins of profit, there is little of that mysterious uncertainty which is the lifeblood of speculation. In fact, the stock market has fallen partially into the category of the nonessential industry. Since the federal reserve board has called upon banks to curtail nonessential credits, in which are placed loans for stock speculation, it is not impossible the supply of money would fall short of market requirements were a big speculative movement to take place. Further, it is felt that Washington might intervene were speculative enthusiasm to reach undue proportions, and so speculators and investors are acting with some degree of caution.

Government Closes Year's Books

Among the recent developments at Washington was the passing by the house of a bill authorizing the issue of $8,000,000,000 in bonds. Figures made public by Chairman Kitchin, of the house ways and means committee, showed that over $5,590,000,000 had been loaned prior to June 26 by the United States treasury to allied governments. The government closed its books for the fiscal year ending June 30, on Saturday. New annual records were opened on Monday. More than $12,600,000,000 was the actual outlay during the year to meet the big bills for the army, navy, shipbuilding, airplane construction, coast defense requirements and other government activities, including the loans to the allies to finance purchase of war materials in this country. War requirements are now draining from the treasury about $50,000,000 a day, the outlay for June being estimated about the same as May, or about $1,500,000,000. During the fiscal year receipts from Liberty loans were slightly over $7,500,000,000, while from income excess profits taxes they were approximately $2,500,000,000, including revenue still to come in. Miscellaneous revenue sources and the sale of savings and thrift stamps accounted for $1,100,000,000 more.

To Gather in War Profits

The taxes last year of $2,500,000,000 were a heavier burden than business men in this country ever before had shouldered. But we are informed by Washington that this year the taxes must provide at least $8,000,000,000, or about three times the amount of last year. Simultaneously, the federal trade commission states that profiteering exists among American industries at the present time, laying stress on the "heavy profit made by the low-cost concerns under a government-fixed price for the whole country". It does not seem probable that the war industries board will deviate from its present price policy, but Wall street believes the new tax policy will be designed even more carefully than the last, to gather in the bulk of such large profits as there may be.

Wants Receiver Appointed

A rule has been issued to show cause why a receiver should not be appointed for the American Pipe & Construction Co., Trenton, N. J., a $5,000,000 corporation. Insolvency is alleged in a bill filed in the court of chancery for Charles A. Hitchcock, of New York, a stockholder. The concern is one of the largest of its kind in the country and was incorporated in 1889. The company has outstanding 50,000 shares of stock. In the bill it is asserted that no dividends have been paid since 1914, and that the business is now being conducted at a loss and to the prejudice of the stockholders' and creditors' interests. As guarantor of the subsidiary organizations the American Pipe & Construction Co. is liable for their debts, which with its own are said to be in excess of its assets. Bonds of subsidiary corporations held by the company aggregate in value $3,755,300, nearly all of which is secured by mortgages on the property of the subsidiaries. The company also owes bills amounting to $728,000.

Huge Taxes Have Been Paid by the Metal Trades

Washington, July 2.—The internal revenue bureau has announced complete statistics of incomes compiled from the returns of 1916 which show a total of 10,907 companies engaged in manufacturing iron and steel and other metals, paying an aggregate of $33,151,823 in taxes on an aggregate net income of $1,994,779,678. The gross income of these same companies, which do not take in concerns mining ores, aggregated $4,664,649,873. The same report indicates 4313 metalworking companies operated at an aggregate deficit of $40,414,591 above a gross income of $194,207,538.

The number of actual iron and steel companies filing returns was 10,096, of which 7410 reported gross incomes of $3,062,395,284, net incomes of $1,129,416,965 and a tax paid total of $22,141,920. Those companies not making payments, 2686, or 26.6 per cent, had a total gross income of $138,924,431, which gave a deficit of $24,462,087. The other metal companies paid a grand tax total of $11,009,903, on a total net income of $565,362,713. Kindred companies, numbering 1627, or 31.73 per cent of the total manufacturing, operated at a loss of $15,952,504.

The statistics are further divided, showing a total of 1018 blast furnaces,

steel works and rolling mills, of which 769 gave a total net income of $425,319,627 for a total tax of $8,406,439. Of 9078 foundries and machine shops, 6614 paid taxes on an aggregate net income of $13,735,481, producing $13,735,481 in revenue. Furnaces and mills operating at a loss reported a deficit of $2,258,963. Foundries and shops reporting losses operated at an aggregate deficit of $24,462,087.

In view of the recent increase in the price of iron ore, figures from iron mining companies have a timely bearing. Only 110 iron mining companies reported net profits, the aggregate being $27,643,620, producing $541,558 in revenue. The other 135 companies making reports—55.1 per cent of the total—operated at a net loss of $2,320,865.

Car builders paid a total tax of $970,918; agricultural implement manufacturers, $631,983; electrical machinery manufacturers, $776,995; shipbuilders, $393,301; carriage and wagonmakers, $296,550; automobile motorcycle and bicycle makers, $3,997,218; engineering, $215,199, and building construction, $242,371.

Permits Dividend Payment

Judge Haight, in the United States court, has granted an order permitting the receivers of the Camden Iron Works, Camden, N. J., to pay out a dividend of 35 per cent on unsecured claims against the company aggregating $1,000,000. The court took into advisement whether bondholders should be permitted to share in the dividend. The receivers were directed to make another report the fourth Monday in November. Unissued bonds in the treasury of the company were directed to be cancelled. Allowances were made to the receivers and their counsel of $25,000 and $15,000, respectively.

Earnings of American Car Increase After Taxes

The American Car & Foundry Co. reports for the fiscal year ended April 30 net earnings of $9,181,742, after charges, including taxes and preferred dividends. This was equal to $30 a share on the outstanding $30,000,000 common stock, as compared with $27.36 a share for the previous fiscal year. After paying the usual preferred dividends of 7 per cent and 8 per cent common dividends, $1,000,000 was added to the reserve for overhauling, improvements and maintenance. The report, remarking upon the war work of the company covering almost exactly the first year of the war for the United States, says:

"Of some important items for the equipment of our armies your company is now turning out in one day a quantity largely in excess of the previous yearly output of the entire country."

The comparative income account of the company for the past two years is as follows:

	1918	1917
Total profits	$16,461,823	$17,522,909
Renewals, repairs, etc.	5,180,081	7,212,037
Net	$11,281,742	$10,310,872
Preferred dividends	2,100,000	2,100,000
Balance	$9,181,742	$8,210,872
Common dividends	2,400,000	1,950,000
Balance	$6,781,742	$6,260,872
Maintenance and imp. res.	1,000,000	2,500,000
Extra common div.	2,400,000	2,250,000
†Special reserve	250,000	500,000
Add. to ins. reserve	500,000	.....
Surplus	2,631,742	1,010,871
Previous surplus	26,820,965	25,810,094
Total surplus	$29,452,707	$26,820,965

†Special reserve for improving working conditions of employes.

Financial Crop Ends

To provide additional working capital and funds for plant extensions, the Petroleum Iron Works Co., which operates a fabricating plant at Masury, near Youngstown, O., has increased its capital stock from $1,500,000 to $2,000,000. Plates are being produced at the rate of from 1200 to 2000 tons monthly for the Emergency Fleet corporation, principally for use at Hog Island. The company also builds tank cars.

* * *

The following concerns recently increased their capital stock: Gray Motor Co., Detroit, manufacturer of marine and motor car engines, from $550,000 to $1,000,000; The Globe Foundry & Machine Co., Sheboygan, Wis., $50,000 to $75,000; Eclipse Mfg. Co., Indianapolis, manufacturer of automobile supplies, $50,000 to $150,000.

* * *

Capitalized at $500,000 and planning to float a $500,000 bond issue, the Peninsula Shipbuilding Corp. will erect a shipbuilding plant at Muskegon Lake, Mich.

Made Eastern Agent

The Booth-Hall Co., 565 West Washington boulevard, Chicago, metaliurgists, engineers and builders of electric furnaces for the melting, smelting and refining of metals, have just concluded arrangements with the Bradford-Ackermann Corp., 30 East Forty-second street, New York City, to take entire charge of sales in the eastern section of the United States. Both Messrs. C. C. Bradford and A. H. Ackermann have had extensive experience in the sale of electrical apparatus. They are both graduate electrical engineers. Mr. Ackermann was formerly vice president and general manager of the United States Light & Heat Corp., Niagara Falls, N. Y., and Mr. Bradford was general sales manager of the same company.

Toluol Scarce

And Few Releases to Outside Trade Expected—Delay Benzol Buying

New York, June 29.—Applications for toluol for delivery to essential commercial consumers during July, now are being considered by the war industries board. Present indications are that smaller quantities will be released than for May and June, since toluol is scarce. On such releases $1.50 per gallon continues on tank cars, while for drums the price is $1.55 per gallon.

It now is expected that the proposed large government purchases of benzol will not materialize until next fall. In the meantime government buying is of a hand-to-mouth order and does not involve quantities which are large enough to affect the market. Commercial demand involves fair quantities but there was nothing unusual about the business transacted this week. Pure benzol continues to be quoted at 25 to 30 cents per gallon.

Sales of sulphate of ammonia involved a few spot carloads at $5.65 to $5.75 per 100 pounds, tidewater. Practically all of the output continues to go to government plants for manufacture into nitrate of ammonia. It now is believed that the greater part of the sulphate output will be taken by the government for the period of the war. The navy department is expected to place large orders for solvent naphtha during the next week. Market developments this week were few. Some spot business was booked on the basis of 18 to 22 cents per gallon.

Coke Oven By-Products

Spot

Per Gallon at Producers Plant	
Pure benzol	$0.25 to .30
Toluol (on sales sanctioned by government) (tank cars)	1.50
Toluol (on sales sanctioned by government) drums	1.55
Toluol (for government)	1.50
Solvent naphtha	.18 to .22
Per Pound at Producers Plant	
Phenol	$0.47 to .50
Naphthalin (nominal)	.10 to .12
Per 100 Pounds at Seaboard	
Sulphate of ammonia (nom.)	$5.65 to 5.75

Contract

Pure benzol	nominal
Toluol	no market
Solvent naphtha	nominal
Per Pound at Producers Plant	
Phenol	nominal
Per 100 Pounds at Seaboard	
Sulphate of ammonia (for commercial use)	no market
Sulphate of ammonia (for government)	$4.50

Obituaries

DR. EDGAR MARBURG, secretary and treasurer of the American Society for Testing Materials, and one of the most distinguished engineers in the country, died at the University hospital, Philadelphia, June 27. He had been in poor health for the last two years, but a recent complication of heart and kidney trouble caused a complete breakdown and finally his death. For 26 years he was professor of civil engineering at the University of Penn-

DR. EDGAR MARBURG

sylvania, and in addition, for 16 years, he was the leading spirit in the American Society for Testing Materials. Through his affiliation with this organization he was known to manufacturers and users of engineering materials not only throughout the United States, but all over the world.

Although organized in 1898 as a section of the International Association for Testing Materials, the American society dates back only to 1902, when it became an independent body. Edgar Marburg was elected secretary-treasurer at that time, and held this position continuously until his death. Last year failing health compelled him to absent himself from an annual meeting for the first time, and while last week's gathering was in session, his death was announced. To his sterling character, rugged honesty and untiring activity the success of the society largely is attributable. When organized in 1902 its membership was 175, and at the time of his death it had grown to 2300, ranking as the leading organization of testing engineers in the world.

Dr. Marburg was 54 years old on March 4. He was graduated from Rensselaer Polytechnic institute, Troy, N. Y., in 1885 and became associated with the Carnegie Steel Co., Pittsburgh, shortly thereafter. In 1892 he went to Philadelphia to accept the professorship of civil engineering at the University of Pennsylvania, and at that time some of the students in his classes were older than he.

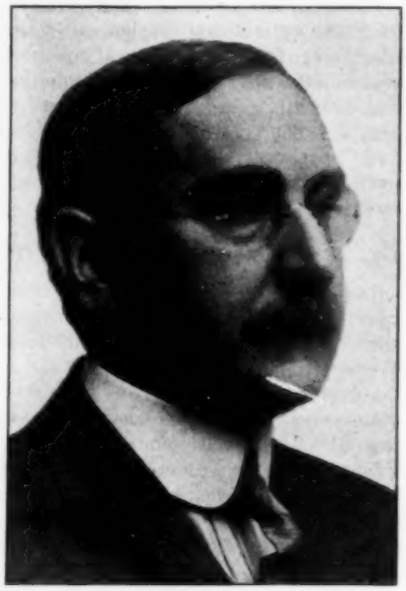
He was a member of the American Society of Civil Engineers, the Society for the Promotion of Engineering Education, and he was a former president of the Engineers' club of Philadelphia. He was a frequent contributor on civil engineering subjects to technical magazines, and was author of a volume on "Framed Structures and Girders" that is used as a textbook in many colleges. With the late Prof. Henry W. Spangler, he planned the engineering building of the University of Pennsylvania, one of the most complete of its kind in the world.

Josiah Churchill, for 25 years a member of the firm of Churchill & Allen, tack manufacturers, Lynn, Mass., died at his home there recently. He was 73 years old and was born at Halifax, Mass.

Benjamin Seward Porter, for over 40 years secretary and treasurer of the Aetna Nut Co., Southington, Conn., died at his home in that town, June 24, after a long illness. He was 71.

John H. Kerr, aged 45, secretary of the Canadian Westinghouse Co., died at his home in Hamilton, Ont., June 24. Mr. Kerr was born in Allegheny, Pa., and had been an employe of the Westinghouse company all his life. After serving in various capacities in the Pittsburgh office, he was sent abroad in 1902 to act as treasurer of the British Westinghouse Co. Later he was appointed to the position he occupied at the time of his death.

Robert Brown Carnahan Jr., whose death was noted briefly in last week's issue of THE IRON TRADE REVIEW, has been affiliated with the American Rolling Mill Co., Middletown, O., since 1900. His first position was that of chief chemist and superintendent of the open-hearth department. During that period of service, he evolved the company's product known as "Armco ingot" iron. Prior to his association with the American Rolling Mill Co., after being graduated from the University of Pittsburgh in 1891, he performed some research work for the owners of the W. DeWees-Wood plant at McKeesport, Pa., in connection with a gold mine prospect. Later, he was actively associated with the



ROBERT B. CARNAHAN JR.

McKeesport plant and then was employed at the Homestead works of the Carnegie Steel Co., doing special work in connection with the manufacture of open-hearth steel.

W. S. Kidd, aged 70 years, president of the Kidd Drawn Steel Co., died Thursday night, June 20, at his home in Beaver, Pa. The plant of the Kidd Drawn Steel Co., is situated at Aliquippa, Pa.

Hugh Hannan, who for a long period of years has been head of the Hannan-Finton Co., Springfield, Mass., machinist and machinery dealers, died at his home in that city recently.

Thomas L. I. Jones, treasurer of the Chrome Steel Works, Chrome, N. J., died recently at his home in that city, after a lingering illness He had been affiliated with the Steel works for about 30 years.

Tool Builders Rear War Machine

Country Fast Approaches Place Where Only Essential Machines Will be Produced—Month of June Marks Extensive Activity in Shipyard, Railroad and Gun and Shellmaking Plant Buying

FROM week to week it becomes increasingly apparent that the machine and tool industry is depended upon to furnish the integral parts of the great war machine which the United States has placed in operation on the western front. In final analysis, machines will perform an important office in bringing victory. Behind each casualty list is a drive. Each drive means the consumption of much ordnance. An unending stream must continue to flow across to the army in the field. This means more and more work for the machines at home. An ever-increasing number of drives increases the use of munitions and necessitates plant expansion; the maintenance in first-class condition of railroad transportation facilities, more ships and additional shipyards as well as fabricating plants for them. This condition was reflected as never before during June. The great question confronting the machine tool industry is: Will the supply from present sources be sufficient? Nonessential machine production has not only been curtailed, it has been practically abandoned. Doubtless every machine extant today could be used on war work if it were rightly placed. That is the problem that confronts manufacturer and dealer alike. For some time crane builders have been operating at 100 per cent capacity on direct or indirect war work. Machine tool builders are rapidly devoting their entire output in the same way. Price no longer is the main consideration, since the matter of delivery is of paramount importance.

Shipyard Expansion Creates Demand

ANNOUNCEMENT that on July 4, 100 cargo ships will be launched, comes after intensive work on the part of the shipyards. Their expansion has caused great activity in the machine tool market. Statements made by Director of Shipping Charles M. Schwab indicate that in the year beginning July 1, 6,000,000 tons of shipping will be produced. Fabricating plants are getting their stride. These steel plants fabricate plates and shapes in standard sizes for assembling at the shipyards. It was expected that the Bethlehem Shipbuilding Corp. would build two plants, one on the Atlantic and the other on the Pacific coast, but the former was abandoned. For its plant at Alameda, on which work has started, it will require over 100 machine tools and about 100 cranes. The company's Sparrow's Point, Md., yard is to be enlarged. The Todd Shipbuilding Co., Tacoma, Wash., plans extensions involving the expenditure of $1,000,000. The Northwest Steel Co., Portland, Ore., will build four shipways to its present plant on the Willamette river. The Skinner & Eddy Corp., Seattle, Wash., will expend $2,000,000 for a ship repair plant and dry docks and the Hewitt Dry Dock & Shipbuilding Co., Tacoma, Wash., is to build a plant with 20 shipways. Both require machine tools and cranes.

Railroad Ordering is Held Up

INSTRUCTIONS from the railroad administration that all shops must be ready for the repair demands that will come in the fall and winter have given impetus to railroad inquiry for machine tools, etc. Railroad buying, however, which was expected to materialize in June, is still in abeyance. It is stated that the red tape involved delays order placement. Specifications go to New York, in some instances, thence to Washington, back to New York, and are returned to the agent who files them. All items on lists issued must be tabulated and the shop named where each machine is to be placed. This doubtless anticipates the necessity of having an accurate inventory in the event that the railroads are released from government control. Striking because of its size, the New York Central railroad inquiry for over 175 machines was the biggest development of the month. This was followed by several supplementary lists. Order placement is expected to follow inside of a few weeks. The Lake Erie & Western railroad inquired for about 10 miscellaneous tools.

Gunmaking Tool Lists Expected Daily

GUN plant erection in the near future spells large machine tool inquiries. The Midvale Steel & Ordnance Co., Philadelphia, is buying against its inquiry for about 120 large machine tools and 27 overhead traveling cranes. This machinery is desired for its plant at Nicetown where 16-inch howitzers will be produced. Difficulty in obtaining large forging presses and lathes is anticipated. This inquiry is to be increased later. The United States Steel Corp. has made tentative inquiry for machines for the Neville Island ordnance plant, where it expects to turn out fifteen hundred 12, 14 and 16-inch shells per day. A definite tool list is expected daily.

Effort Seems Concentrated on Large Shells

EARLY in the month, a shell plant to cost $6,500,000 was announced as being built in Chicago for the United States ordnance department by the Symington interests at Rochester, N. Y. Equipment is needed to produce 10,000 shells a day. Inquiry is out for 18 cranes for the forge shop and while some tentative inquiry for machine tools has been made, the orders have not been placed. The American Steel & Machine Co., Pullman, Ill., has bought equipment for a large shell plant at Bucyrus, O. The L. Wolff Mfg. Co., Chicago, Ill., received a contract for 155-millimeter shells and that size is being made by the Templar Motors Corp., Cleveland. The United States Ammunition Co. has taken over the former Fiat automobile factory at Poughkeepsie, N. Y., and will make 9.2 and 6-inch shells. The Peninsular Shell Co., Saginaw, Mich., has a contract for 1,000,000 trench mortar shells. The American Shell Co., Paterson, N. J., plans to erect a plant to produce large shells.

Further Aircraft Activity Expected

THE Wright-Martin Aircraft Corp., New Brunswick, N. J., is expected to buy upward of $1,500,000 worth of equipment, which will include several hundred thousand dollars worth of machine tools. Its Long Island City, N. Y., plant will be equipped to make 50 motors a day. Its list of tools given out during the middle of the month was withdrawn for revision and it is expected that it will be increased. Nine milling machines were purchased in June for the Pensacola aviation school in Florida and further requirements of this kind from other schools are anticipated. The Engel Aircrafts Corp., Niles, O., has an inquiry out for wood-working machinery, planers, etc.

Shipping Basis of Equipment Buying

Crane Demand Continues to Feature the Machinery Market—Fabricating Plant Closes For 58—Builders to be Called to Washington—American Shipbuilding Adds to Tool List—Railroad Buying Imminent

SHIPBUILDING continues to furnish the main avenue for the disposal of machine tools, as well as cranes. Fabricating plants, which are producing standardized sections, are inquiring for and have bought heavily in both cranes and machine tools. This same is true of the assembling and shipbuilding plants. In the east, much interest is shown in the prospects of the government placing a huge order for about 500 gantry and overhead cranes. Because the government's crane requirements are increasing beyond all anticipations, it is probable that electric crane builders will be asked to make a similar arrangement to the one now extant between the locomotive crane builders and the war industries board. A noteworthy piece of business was obtained by Manning, Maxwell & Moore, Inc., recently from the McClintic-Marshall Construction Co., Pittsburgh, for 58 cranes for its fabricating plant. The order is attractive since 50 are of one size. Two 100-ton electric overhead cranes are to be furnished to the Westinghouse, Church, Kerr & Co., New York City, for the Baltimore & Ohio railroad, by the Morgan Engineering Co., Alliance, O. Despite the delay in ordering cranes, the Bethlehem Shipbuilding Corp. has covered on approximately $500,000 worth of punching and shearing equipment. The American Shipbuilding Co., Cleveland, has added to its original list and desires a number of small tools. Many rumors are afloat in the Chicago market. One anticipates the building of a shellmaking plant with a daily capacity of fifteen thousand 155-millimeter shells. New machinery for stock is scarce and the used machinery market has received considerable impetus. In Cleveland, inquiries for used machinery are heavy, but dealers are unable to locate all they require. It is understood that specifications and recommendations on a portion of the New York Central railroad's large list of tools, have gone forward and order placing is now a matter of the near future. A supplementary list of about 30 machines has been issued by that railroad. Inquiries and orders for small tools continue to pour into the market although dealers report the usual end-of-the-month slump in order placing. However, it is expected that the second week in July will see improvement.

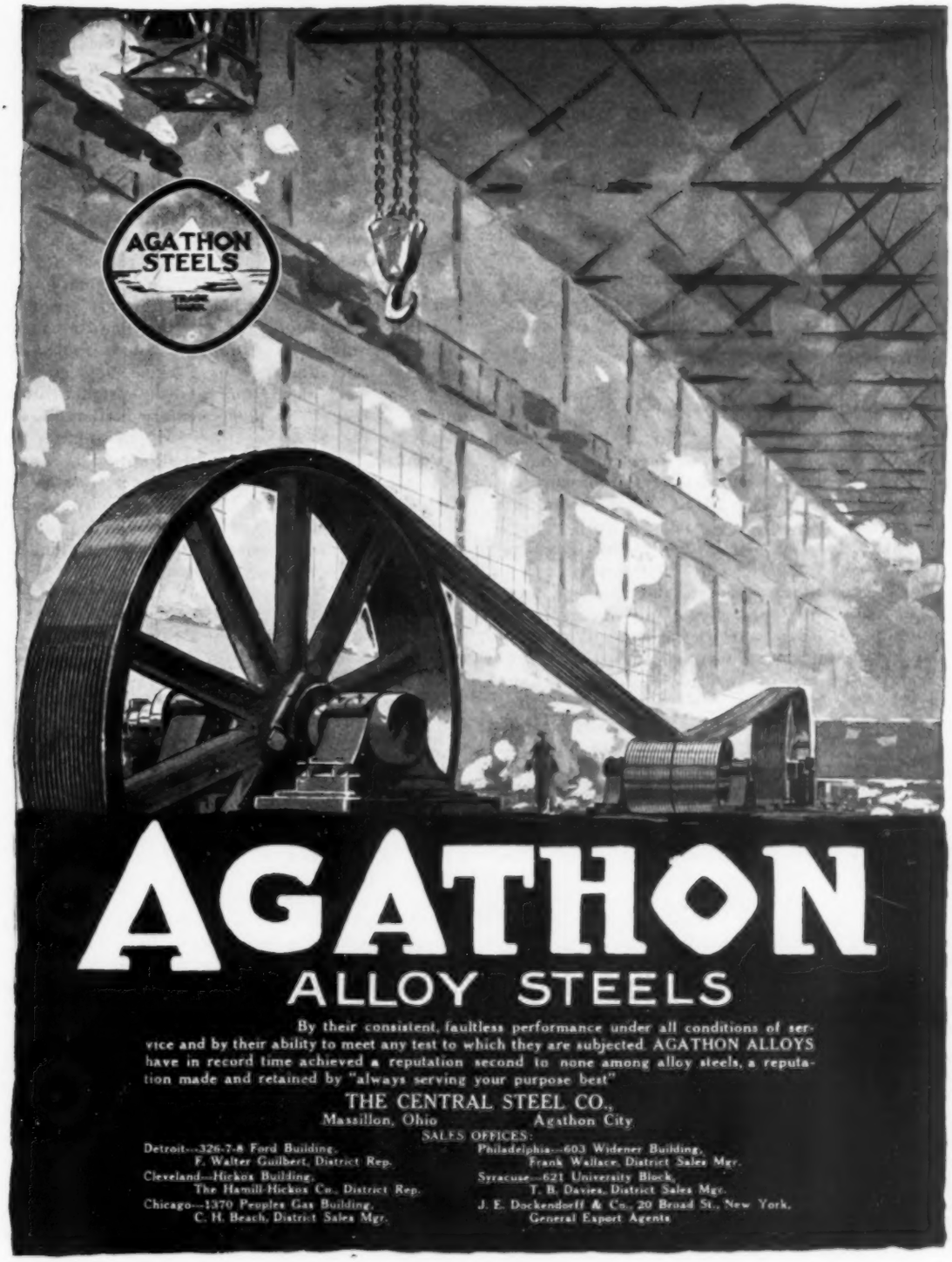
Prospective Government Crane Order Is Huge

REPORT now current that the government will purchase shortly from 400 to 500 gantry and overhead cranes has set the electric crane industry in a whirl. While this report lacks official confirmation, it, in view of certain contingent developments, is being received with credence by the trade generally. It is understood that at least 200 of these cranes, comprising 5 and 10-ton overheads, will be for use of the American expeditionary forces in France. In this connection, it is stated that 40 locomotive cranes also will be required for service abroad.

As a result of the exceedingly heavy demand likely to develop in the near future, it is understood that manufacturers of electric cranes will be called to Washington at once with a view to perfecting an arrangement similar to that now in effect with builders of locomotive cranes, and that all purchases in the future will be under the jurisdiction of a newly established division of the war industries board. It is stated, as a specific example of the effect of the possibility of such arrangement upon current business, that the Bethlehem Shipbuilding Corp., which was to place orders for a large number of gantry and overhead cranes for its Alameda plant during the past week, has deferred action and that in all probability these cranes will be allotted through the war industries board. However, negotiations on the tower and hammerhead cranes continue, it being believed that builders of this equipment will not, at least for the present, be affected by the proposed arrangement.

Despite delay in awarding cranes, the Bethlehem Shipbuilding Corp. has been the largest buyer of equipment during the past week. In addition to covering on heavy machine shop requirements, the company has purchased about $500,000 worth of punching and shearing equipment. Considerable shell-making equipment also has been purchased in the eastern market of late for shipment to Canada. The Thompson-Starrett Co., New York, is inquiring for a number of tools for plant C at the government's explosive works near Charleston, W. Va. A number of tools will be purchased within the near future by Terry & Tench, New York City, who are building a plant at Long Island City for the construction of steel barges. Another company expected in the market shortly is the Air Nitrates Co., New York City. This company is understood to have contracts for the construction of two additional nitrate plants for the government. At present, it is in the market for eight new or used locomotive cranes. Action on the additional machine tool requirements of the Wright-Martin Aircraft Corp., the New York Shipbuilding Corp. and the Newport News Shipbuilding & Dry Dock Co. is still pending. Miscellaneous demand for small lots of tools has dropped off, and some sellers report the week as being the most quiet this year.

Perhaps the largest crane business to be placed during the past week is that of Westinghouse, Church, Kerr & Co., New York City, involving nine electric cranes for Baltimore & Ohio railroad shops in Maryland. Of this lot, the Morgan Engineering Co. received two 100-ton overheads, and the Toledo Bridge & Crane Co. the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ALLOY STEELS
By their consistent, faultless performance under all conditions of service and by their ability to meet any test to which they are subjected AGATHON ALLOYS have in record time achieved a reputation second to none among alloy steels, a reputation made and retained by "always serving your purpose best"
THE CENTRAL STEEL CO.,
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SALES OFFICES:
Detroit—326-7-8 Ford Building,
F. Walter Guilbert, District Rep.
Cleveland—Hickox Building,
The Hamill-Hickox Co., District Rep.
Chicago—1370 Peoples Gas Building,
C. H. Beach, District Sales Mgr.
Philadelphia—603 Widener Building,
Frank Wallace, District Sales Mgr.
Syracuse—621 University Block,
T. B. Davies, District Sales Mgr.
J. E. Dockendorff & Co., 20 Broad St., New York,
General Export Agents

remainder, comprising four 3-ton wall cranes, one 15 and one 30-ton overhead, and one 15-ton single-legged gantry. The Federal Shipbuilding Co. recently placed four 10-ton overhead cranes with the Milwaukee Electric Crane & Mfg. Co. The Atlas Crucible Steel Co. awarded the Cleveland Crane & Engineering Co. a contract for a 25-ton overhead crane with 55-foot span. The American Car & Foundry Co. is reported to have purchased two 10-ton overheads from the Shaw Electric Crane Co. The Nichols Copper Co., Laurel Hill, Long Island, has bought one 15-ton crane, with 58-foot span, and one 5-ton with 105-foot span. The Vulcan Detinning Co., Sewaren, N. J., has purchased a 7½-ton overhead crane. The Crown Brass Co., 149 Broadway, New York City, is inquiring for five overhead cranes, including three of 5, 10 and 15 tons capacity respectively. The Downey Shipbuilding Co., New York, is in the market for a 10-ton crane in addition to the 35-ton crane inquired for recently. It is understood that the Providence Engineering Co., Providence, R. I., which is building engines for the Downey company, recently purchased an overhead crane from the Case Crane & Engineering Co., Columbus.

New Machinery Scarce in Chicago

MACHINE tool buying in the Chicago district continues to consist mostly of small lots and single tools, usually of the heavy variety. An unusual demand for boring mills has been experienced recently, coming from makers of gun mounts and tractors. Railroads are not taking much equipment, the New York Central list still pending, and the Rock Island issuing a small inquiry. The Four Lakes Ordnance Co., Madison, Wis., is undertaking an additional order for the government and is inquiring for large lathes, planers and similar heavy equipment to double its capacity. The Amalgamated Machinery Corp. is understood to be undertaking construction of a fifth immense concrete planer, to be 200 feet long and 14 feet between housings. Various rumors are in the air. One relates to a proposed plant with a daily capacity of fifteen thousand 155-millimeter shells. Another rumor is that a Madison machine builder has bought a large plant in Chicago and will manufacture heavy gun boring machines. Dealers experience difficulty in obtaining new machinery for stock and assortments on floors are beginning to be depleted. At present the custom is to place an order with a manufacturer for future delivery, which is simply a reservation, and furnish priority certificates as the machines are sold by the dealer. This condition is having the effect of increasing the desirability of second hand equipment and it is being sought eagerly. Machine tool dealers are making representations to the war industries board that it is well to have a reserve of machinery in the hands of dealers where it can be obtained for spot delivery when emergency arises and when new plants require equipment to fill in and make operation complete. Considerable activity is evident in meat packing plants in Chicago and the northwest and cold storage facilities largely are being increased. The Winther Motor Truck Co. will build a plant at Kenosha, Wis. The De Pere Mfg. Co., De Pere, Wis., will build an addition to its boiler and structural shop and to its machine shop. The Globe Seamless Steel Tubes Co., Milwaukee, will build two large extensions. The Arkansas & Memphis Railway Bridge & Terminal Co. is making preparations to complete the Harahan memorial bridge at Memphis. The board of waterworks at Louisville, Ky., is taking bids on a pumping engine of 40,000,000 gallons capacity.

Contracts for cranes have been taken by western builders recently in good volume. The Terry Shipbuilding Co., Savannah, Ga., has given an order to the Milwaukee Electric Crane & Mfg. Co., Milwaukee, for six 10-ton cranes of 70-foot span. This was noted previously as having been given to the Cleveland Crane & Engineering Co.

The Milwaukee builder has also received orders recently as follows: Vulcan Iron Works, Wilkesbarre, Pa.; seven cranes 5 to 40-ton capacity, all 67-foot span; Federal Shipbuilding Co., New York, four 10-ton, double carrier, 80-foot span; 5-ton, 60-foot span for Wickwire Steel Co., Buffalo; 10-ton, 80-foot span, for Atlas Steel Castings Co., Buffalo; 30-ton, 40-foot crane for George Whiting Co., Chicago; 10-ton, 60-foot crane for Northwest Engineering Co., Green Bay, Wis.; 5-ton, 38-foot crane for Simmons Co., Kenosha, Wis.

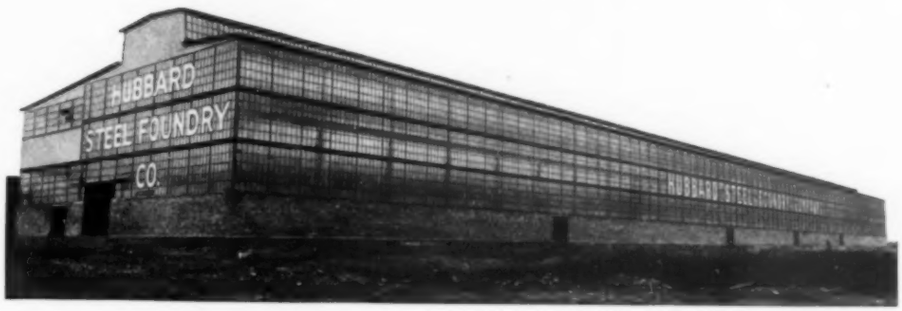
Small Tool Buying Predominates

CONSIDERABLE buying of small tools is current in the Cleveland market. In addition to the big list of punching and shearing equipment asked for recently, the American Shipbuilding Co. is in the market for about a dozen small tools. Included in this list are one 18-inch x 10-foot centers motor-driven lathe; one 26-inch x 18-foot centers motor-driven lathe; one 5-foot radial drill, one universal tool grinder, one 2½-inch bolt cutter; one 2 or 2½-inch bar shear; one 20-inch upright drill and five portable grinders. A supplementary list has likewise been issued by the New York Central railroad, for tools for its central west shops, as follows: One combination grinder; one 42-inch heavy-duty planer; one 36 x 36-inch 12-foot bed planer; five 24-inch high-duty shapers; one 1¼-inch drill press; two 104-inch boring and turning mills; one 42-inch boring mill; one punching machine with 12-inch throat, with capacity to punch 1-inch hole through 1-inch steel; one 30-inch power cold saw; one No. 3 rotary bevel shear; one 96-inch 500-ton hydraulic wheel press; one 24-inch slotter; two universal tool grinders; one 3½-foot radial drill; one 24-inch x 12-foot engine lathe; one 4-inch turret lathe; one 18-inch x 14-foot engine lathe; one 30-inch, 6-foot 6-inch centers, engine lathe; one 26-inch x 10-foot back geared engine lathe; one 18-inch x 8-foot engine lathe; one 24-inch x 8-foot engine lathe; one 3-inch x 36-inch turret lathe; one 18-inch x 8-foot lathe; one 6000-pound steam hammer. Specifications and recommendations on a portion of the New York Central's list of about 175 machines issued a few weeks ago, have gone forward to New York. These then will be forwarded to Washington, it is believed, and orders will follow within a few days. The Troy Wagon Works, Troy, O., has come into the market with a small list of tools for making axles, including lathes, drills, etc. Woodworking machinery, planers, etc., are desired by the Engel Aircraft Corp., Niles, O. An inquiry has been received for one No. 4 or 5 plain Kearney & Trecker milling machine. Used machinery would find ready placement if it could be purchased. A representative of Manning, Maxwell & Moore, Inc., from Seattle, has been endeavoring to purchase 10-foot to 30-foot boring mills and 84-inch, 96-inch and 120-inch planers. Dealers report the usual lull that comes at the end of the month and the beginning of another.

Cranes Bought for Fabricating Plants

One of the best orders of the week from the builders' standpoint, was one placed by the McClintic-Mashall Construction Co., Pittsburgh, with Manning, Maxwell & Moore, Inc. It was for 58 small electric cranes, 50 of one size and eight of another for ship fabricating work. So many of one size made it a manufacturing proposition rather than a building one. The Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., has been in the market for cranes and recently purchased 16 of a medium size.

SPEEDING with ROLLING MILL JIM



Say Fellows! you remember the first of March I told you the "Hubbard" broke ground for a new foundry? Well here's a picture of her, she started with a BANG, June 3rd. Just 93 days! She has ***some*** up-to-date equipment in her, installed by ***some speed artists,*** I'll say: electric furnace, open hearth furnace and all that swell stuff. Pike her off for yourself!

So long,

Rolling Mill Jim.

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

New Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Factories

NASHUA, N. H.—Bids have closed for a waste building for the Jackson plant of the Nasha Mfg. Co. C. R. Makepeace & Co., Providence, R. I., are the engineers.

BOSTON, Mass.—The Portland Foundry Co. plans the enlargement of its plant.

BOSTON.—The Thorndike Co. will make additions costing $500,000, including a 4-story weave shed, 132 x 325 feet, and a 5-story iron and steel warehouse, 75 x 195 feet.

FALL RIVER, MASS.—The American Printing Co. has let the contract for a brick and concrete, 1-story, 40 x 100-foot building; a 3-story, 38 x 75-foot caustic storage house and a brick, 1-story, 15 x 27-foot pump house on Water street, to cost $33,000.

HOLYOKE, MASS.—The Deane Steam Pump Works has let the contract for a brick and steel, 1-story, 90 x 200-foot addition to its machine shop and an 80 x 180-foot foundry.

MALDEN, MASS.—Plans have been prepared for a steel and iron, 1-story, factory for the Eastern Metal & Refining Co.

NEWTONVILLE, Mass.—The Silver Lake Co. let the contract recently for the erection of a 2-story 50 x 100-foot addition.

NEW BEDFORD, MASS.—The National Spun Silk Co. is receiving bids on the construction of a 40 x 160-foot addition.

NORTH ANDOVER, MASS.—The Davis & Furber Machine Co. is building a brick and steel, fireproof, 2-story, 80 x 160-foot addition to its machine shop.

ORANGE, MASS.—The New Home Sewing Machine Co. will start work on the construction of several additional factory buildings, to cost $250,000.

SOMERSET, MASS.—The United States shipping board will build a 1-story, 75 x 100-foot machine shop for the Crowninshield Shipbuilding Co.

SPRINGFIELD, MASS.—Plans are being figured on for a brick addition to the plant of the Springfield Aircraft Corp.

SPRINGFIELD, MASS.—Plans are being drawn for a brick, mill construction, 2-story and basement, 40 x 80-foot addition to the factory of the W. J. Hyland Mfg. Co.

UXBRIDGE, MASS.—The N. E. Power Co. plans to build a $768,000 addition to its power plant and install an additional turbine of 10,000 kilowatts capacity.

WINCHESTER, MASS.—The Whitney Machine Co. has let the contract for an addition to its factory.

WORCESTER, Mass.—The Graton & Knight Mfg. Co. has let the contract for a brick and concrete, 1-story, 68 x 61-foot manufacturing building.

GREENVILLE, R. I.—The Grennville Finishing Co. is said to have completed plans for the erection of a 3-story, 90 x 150-foot manufacturing building.

PAWTUCKET, R. I.—The Lorraine Mfg. Co. will build a 2-story, 41 x 113-foot and 32 x 157-foot weave shed, to cost $40,000.

PROVIDENCE, R. I.—The Aberthaw Construction Co., Boston, has leased land from the city and will lay out a yard and two constructing ways for building concrete boats. It will be 300 x 600 feet.

ANSONIA, CONN.—The Ansonia Novelty Mfg. Co. has purchased an acre adjoining its plant for the construction of an addition.

BRIDGEPORT, CONN.—Bids close July 10 for a brick or concrete sewage and pumping station for the city, to cost $300,000.

BRIDGEPORT, Conn.—The Singer Mfg. Co. will build a 1-story monitor addition to one of its shops.

BRIDGEPORT, CONN.—The Lake Torpedo Boat Co. has awarded the contract for two machine shop additions to the Casper-Ranger Construction Co., Holyoke, Mass. The buildings will be one story, 40 x 82 feet and 24 x 40 feet.

HARTFORD, Conn.—The Colt's Patent Fire Arms Mfg. Co. will erect a 1-story storage building.

KILLINGLY, CONN.—A $25,000 power house, 60 x 80 feet, will be built by the Goodyear Cotton Mills Inc.

MIDDLETOWN, Conn.—The Draper & Hall Co., maker of grinders and tools, will build a 30 x 50-foot addition.

NEW BRITAIN, CONN.—The Traut & Hine Mfg. Co. has let the contract for a brick, 3-story, 43 x 93-foot storage building, to cost $25,000 and a fireproof, 1-story, 46 x 96-foot building, to cost $10,000.

Government Inquiries

BIDS on the following equipment are desired by the navy department bureau of supplies and accounts:

Six screw machines, 4777½, July 8, Washington.
Fifty-six screw-cutting lathes, 4778½, July 8, Washington.
Hobbing machines, 4784½, July 8, Washington.
Ten arbor presses, 4785½, July 8, Washington.
One tool grinder, 4786½, July 8, Philadelphia.
Two 10-ton air hoists, 4788½, July 8, Washington.
Three grinding machines, 4795½, July 5, Washington.

Schedule numbers, dates of opening and places of delivery follow the specifications of the tools.

Along the Middle Atlantic Seaboard

BINGHAMTON, N. Y.—A wood working plant, two stories, 40 x 65 feet, will be erected by C. W. Gibbs.

BROOKLYN, N. Y.—The Doehler Die-Casting Co. recently took over the plant of the Ohio Electric Co. and is contemplating the erection of an extension.

BUFFALO.—Stewart Motor Corp. will build an addition, 90 x 100 feet.

BUFFALO.—Liberty Aircraft Corp., Tonawanda, N. Y., will build a branch plant here.

BUFFALO.—A $50,000 warehouse, three stories, 60 x 70 feet, will be erected by the Automatic Transportation Co.

BUFFALO. — The Strong Steel Foundry Co. is receiving bids on the erection of a foundry, one story, 50 x 300 feet, with an ell, 12 x 18 feet.

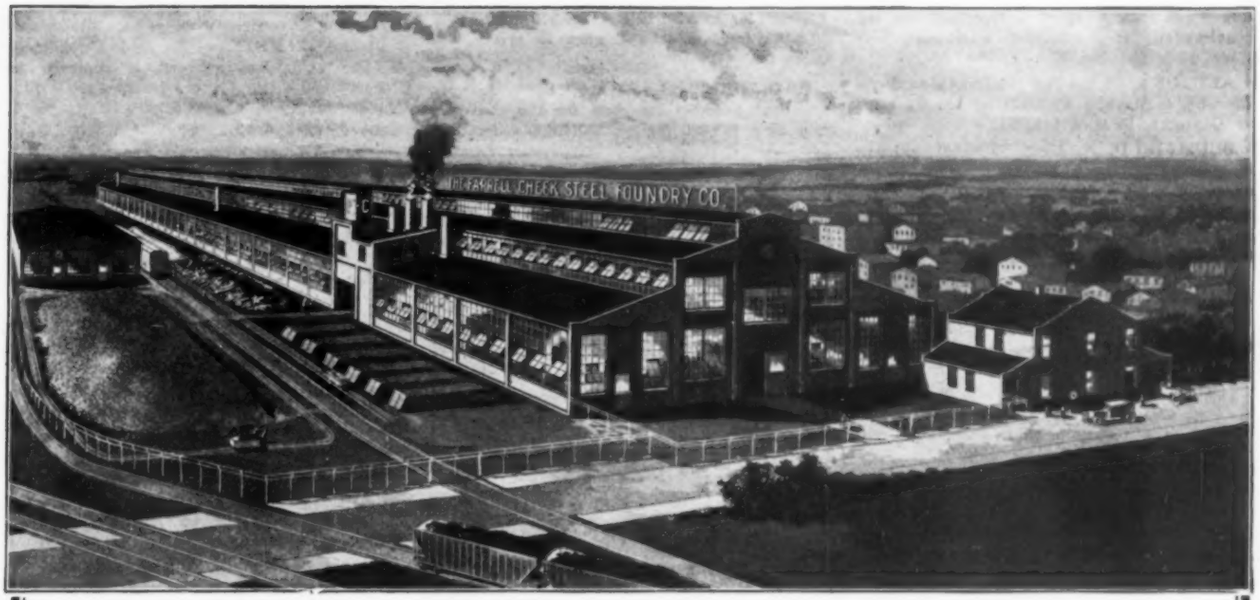
MINEOLA, L. I., N. Y.—A $35,000 extension, 100 x 250 feet, will be made at the

NEW YORK.—Property has been leased at 1729 First avenue by the Manhattan Sheet & Iron Works for construction of a new shop.

SCHENECTADY, N. Y.—Bids now are being received by the American Locomotive Co. through R. H. White, on the erection of a 1-story, 120 x 125-foot addition to its boiler shop. Mr. White also is receiving bids on a 1-story, 80 x 125-foot addition to the plant at Dunkirk, N. Y.

UTICA, N. Y.—The general contract for the construction of a $1,000,000 addition has been awarded by the Globe Woolen Mills to Hopp & Down.

ALLENTOWN, PA.—The Bethlehem Mo-



To all manufacturers of AMERICA

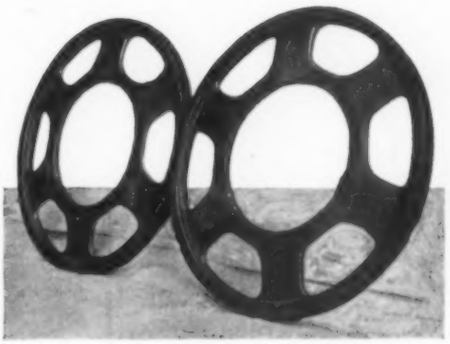
Your product is not one iota stronger than its weakest ***cast part.*** If you are building motor-trucks, tractors, automobiles or machine tools and using small castings, you will find in ***Farrell-Cheek Castings*** an element that cannot be measured in pounds or ounces.

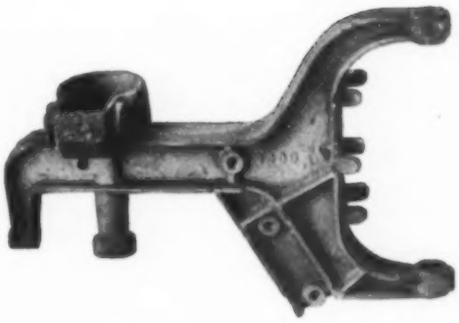
While your product is in use and making a reputation for you, this element can be measured in cold dollars —that is ***Dependability.***

Let us quote you on your next requirements and give you delivery dates. Write at once.

Farrell-Cheek Steel Foundry Co.

SANDUSKY, OHIO





tors Corp. has awarded a contract for the construction of a $30,000 warehouse, one story 80 x 200 feet.

ALTOONA, PA.—The McDanahan Stone Foundry & Machine Co. will rebuild its plant at Gaysport, to cost $15,000.

BLUMFIELD, N. J.—A machine shop will be erected by Owen A. Rodgers, to be one story, 50 x 60 x 65 feet.

CONNELLSVILLE, PA.—The McCarrins Foundry Co., Sixth street, has let a contract for a $15,000 addition, 65 x 66 feet.

HILLSVILLE, PA.—Carbon Limestone Co. will make improvements to its plant.

HYDE CITY, PA.—Nickel Alloys Co. let the contract for a machine shop, 40 x 80 feet and tube mill, 40 x 250 feet.

IRVINGTON, N. J.—The Liberty Machine & Tool Co. is having plans drawn for the erection of a 1-story machine shop, 80 x 100 feet.

LANCASTER, PA.—A. Woelfel has been awarded a contract by the Philadelphia & Reading railroad for the erection of a machine shop, 50 x 175 feet, to cost $50,000.

MAHONON CITY, PA.—County commissioners propose to build a power house.

McKEESPORT, PA.—The McKeesport Tin Plate Co. has bought additional land near here and is planning an extension.

MILTON, PA.—Milton Mfg. Co. will rebuild its forge shop here to be 120 x 140 feet.

NEW BRIGHTON, PA.—Pittsburgh Tool Steel Wire Works plans an addition to cost $11,000.

PHILADELPHIA.—As a result of heavy government contracts, the Baldwin Locomotive Works will enlarge its plant.

PHILADELPHIA.—A 40 x 200-foot machine shop will be erected by the Hero Mfg. Co., to cost $25,000.

PHILADELPHIA.—The American Galvanizing Co. contemplates the erection of a 2-story addition to its plant.

PHILADELPHIA.—The Keystone Supply & Mfg. Co. is receiving bids on the construction of a 3-story factory addition.

PHILADELPHIA.—The G. & H. Barnett Co. has awarded a contract to the M. Wood Easby Co. for the erection of a $15,000 plant addition.

PHILADELPHIA.—A $12,000 manufacturing building will be built by the L. H. Gilmore Co. I. C. Eisenvise is engineer in charge.

PHILADELPHIA.—The Bessemer Motor Truck Co. is having plans prepared for the erection of a 1-story factory building, 90 x 440 feet, at Homesburg Junction.

PHILADELPHIA.—The Austin Co. has the contract for constructing a $30,000 warehouse, 90 x 180 feet, for the Liggett & Myers Tobacco Co.

PHILADELPHIA.—Richard L. Wallace & Co. have awarded contracts for the construction of a $66,000 factory building, 1-story, of brick and steel construction.

PHILADELPHIA.—The S. A. Ashman & Sons Co. has awarded a contract to Robert B. Lederle for construction of a 50 x 120-foot addition.

PHILADELPHIA.—The Belmont Iron Works has taken a contract for the construction of two steel runways, each about 600 feet long, for the Wm. Cramp & Sons Ship & Engine Building Co.

PHILADELPHIA, Pa.—The Midvale Steel & Ordnance Co. is reported contemplating the erection of an extension to its plant here. Just how large the addition will be is not known, but it is said it will be almost as large as the main plant.

PITTSBURGH.—It is reported government officials are considering building a $5,000,000 power plant at Brunots island, just below this city in the Ohio river.

WAYNESBORO, Pa.—The H. T. Shearer Machine Co. recently took over the plant of the Victor Tool Co. and is now equipping it. No extensions to the building at this time are contemplated.

WYOMISSING, PA.—A $200,000 mill 100 x 200 feet will be erected by the Narrow Fabrics Co.

YORK, PA.—The Hoover Wagon Co., this city, will build an addition.

BORDENTOWN, N. J.—The shipbuilding plant of Harry C. Ford, was damaged by fire June 26, with a loss of about $10,000 to building and machinery.

CAMDEN, N. J.—The Warren Webster Co. will receive bids soon for a factory addition.

GLOUCESTER, N. J.—The New York Shipbuilding Co. has awarded contract to McClintick-Marshall Construction Co., Pittsburgh, for the erection of group of new office buildings, machine shops, paint shops, shelter buildings, warehouses and galvanizing plants, to cost $5,000,000.

JERSEY CITY, N. J.—Brady Brass Co. has awarded the contract for the erection of a 4-story factory building, to cost $25,000.

JERSEY CITY, N. J.—National Grocery Co. will build a 4-story addition, to cost $60,000.

NEW BRUNSWICK, N. J.—Middlesex county will build a drawbridge over Raritan river, to cost about $80,000.

NEWARK, N. J.—Mono Service Co. will erect shipping room and office 2-stories, 40 x 100 feet, to cost $19,650.

NEWARK, N. J.—The Clark Thread Co. will erect a 1-story brick factory, 34 x 99 feet, to cost $6700.

POMPTON LAKES, N. J.—Common council will advertise for bids for the erection of a power plant to cost $42,000.

Business Changes

THE Marlin-Rockwell Corp. has purchased the Braeburn Steel Co., of Braeburn, Pa. The acquisition will supply the Standard Roller Bearing Co. of Philadelphia, a Marlin-Rockwell subsidiary, with raw materials and will furnish some steel for the open market. The Marlin-Rockwell Corp. controls the Hopkins & Allen Arms Co.; the Rockwell-Drake Corp., manufacturer of wire wheels; Mayo Radiator Co. and Seubert Bearing Co.

The Keokuk Electro-Metals Co., Keokuk, Iowa, manufacturer of ferrosilicon, has opened an office at 1518 *Corn Exchange Bank building, Chicago, in charge of John Dillon, treasurer.*

Offices and the engineering department of the Wilputte Coke Oven Corp. have been removed to the Winfield building, 468 *Fifth avenue, New York.*

To eliminate duplication of effort the Cleveland office of the Simmons Machine Co., Albany, N. Y., has been combined with its Buffalo office.

J. Lipsity Co., Chelsea, Mass., is moving its New York office to 1818 *Woolworth building.*

At a special meeting of the stockholders of Freyn & Co., engineers and contractors, Chicago, it was decided to change the firm name to Freyn, Brassert & Co.

The Sullivan Machinery Co., Chicago, has opened a branch office at 210 *Union Trust building, Washington, D. C., in charge of Ralph T. Stone of the company's New York office.*

Activities in the Central States

DETROIT.—The Aluminum Castings Co. will build a foundry, 50 x 100 feet.

DETROIT.—The Great Lakes Engineering Co. is planning an erecting shop plant, 56 x 109 feet.

DETROIT.—The General Aluminum & Brass Mfg. Co., Frank C. Root, president, will build additions.

GRAND RAPIDS, MICH.—The Adolph Leitelt Iron Works is contemplating the erection of an addition.

GRAND RAPIDS, MICH.—The Hackett Motor Car Co. is building four new units, three of which will be 70 x 500 feet and the fourth, 60 x 400 feet.

PORT HURON, MICH.—The Mueller Metals Co. is contemplating the erection of a tubing mill, a rod mill, foundry and office building, to be 3-stories of brick construction. The company also is in the market for new equipment.

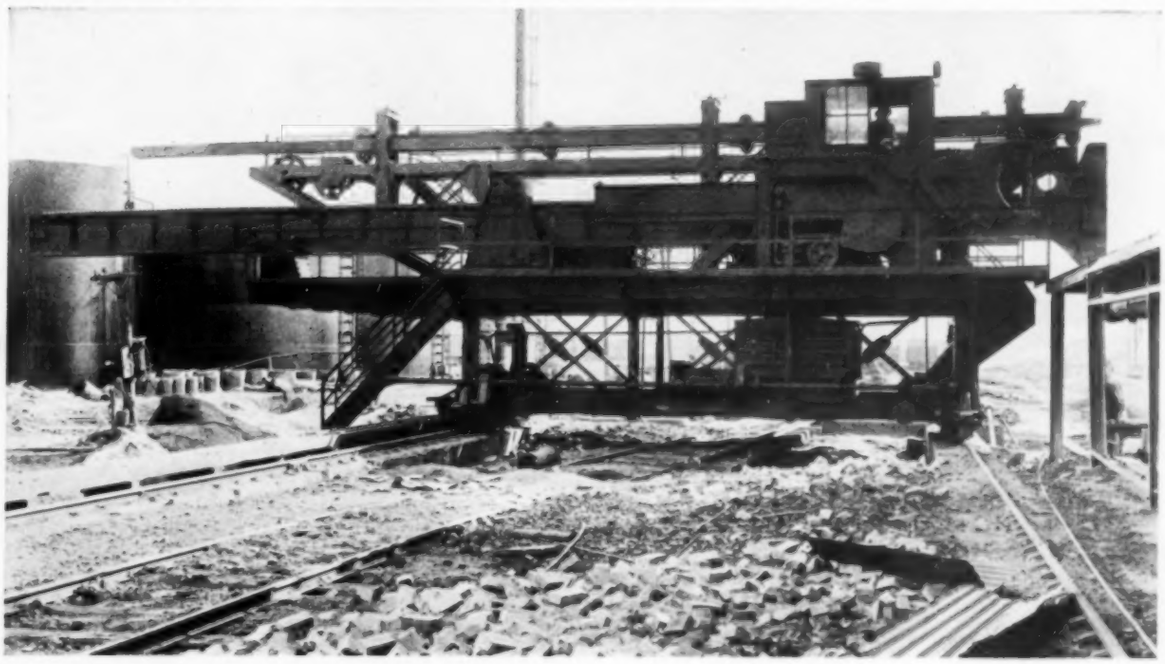
CHICAGO.—The Chernyk Iron & Metal Co., capitalized at $10,000, has been chartered by A. B. Arkin, B. Shulman and M. Abrams.

CHICAGO.—The Concrete-Steel Co. will build a 1-story plant, 225 x 350 feet, to cost $70,000.

CHICAGO.—William Hoffman Jr. is making plans for a foundry, 60 x 150 feet and a tool room, 30 x 34 feet, at Forty-eighth and Morgan streets. The owner's name is being withheld.

CHICAGO.—The Winnebago Tractor Co.,

STEEL PLANT EQUIPMENT
COKE OVEN MACHINERY
GAS PRODUCERS
ORE AND COAL HANDLING MACHINERY
SPECIAL CRANES
MINING MACHINERY
HYDRAULIC TURBINES



Coke Oven Machinery

Since 1899, when the first W-S-M Coke Pusher was designed and built, most large installations of by-product ovens have been served by W-S-M machines.

The leading builders of by-product coke ovens are our principal customers for W-S-M coke oven machinery.

The combined coke pusher, coal leveler and door extractor shown above represents the latest by-product coke oven practice. With a single operator it serves about 100 ovens.

Those interested in the operation or contemplating the installation of coke ovens should have Bulletin A8, "W-S-M Coke Oven Machinery".

THE WELLMAN-SEAVER-MORGAN CO.

CLEVELAND, OHIO, U.S.A.

capitalized at $300,000, has obtained a Delaware charter to build motors and tractors by N. C. Bement, Rockford, Ill., William Luxmore, Chicago, and George N. Whitford, Shabbona, Ill.

CHICAGO.—New plants and additions for meat packing companies are being planned and erected in the Union Stock Yards district. William Davies has had plans prepared for a 9-story cold storage building, 125 x 142 feet, costing $800,000. James S. Agar, president of the John Agar Co., has had plans prepared for a 5-story warehouse to cost $75,000. The Consumers Packing Co. will build two 4-story buildings to contain the abattoir, cold storage, by-product department, power house, tank house and smoke house.

CANNELTON, IND.—Indiana Cotton Mills plans a 2-story concrete addition, 120 x 230 feet, to cost $200,000.

BEDFORD, IND.—The Reliance Mfg. Co., Chicago, is having plans prepared for the erection of a factory here, to cost $30,000.

FT. WAYNE, IND.—The Tokheim Oil Tank & Pump Co., capitalized at $200,000, has been chartered to manufacture pumps and tanks by William J. Fortune, Walter G. Burns and Frank J. Greer.

HAMMOND, IND.—Excavation has been started for the erection of a $100,000 freight depot, 50 x 150 feet, for the Pennsylvania railroad, which will cost $100,000.

INDIANAPOLIS.—The Laco Mfg. Co., capitalized at $150,000 has been chartered to manufacture acetylene generators and appliances by John O. Motto, Miles E. Loehr, and Walter K. Loehr.

AMHERST, O.—The construction of the United States Automatic Co. plant has been started.

BARBERTON, O.—Plans are to be prepared for the erection of a viaduct at Center street, which will be erected at a cost of $16,000.

CINCINNATI.—Martin Fischer, architect, has been commissioned to draw plans calling for a general extension of the new Corcoran plant in Norwood.

CINCINNATI.—The Hill-Bruner Foundry Supply Co., is said to be contemplating the erection of several improvements to its plant. A boiler house is among the contemplated improvements.

CLEVELAND.—The Cleveland Pneumatic Tool Co. plans a factory building.

CLEVELAND.—Plans are being made for a machine shop, 38 x 84 feet, for the P. A. Geir Co.

CLEVELAND.—The Western Machine Products Co. has taken out a permit for the erection of a factory addition to cost $25,000.

CLEVELAND.—The Warren Bicknell Co., has taken over the Cincinnati & Dayton Traction Co.

CLEVELAND.—W. W. Hedges is preparing plans for a factory building for the Great Western Oil Co.

CLEVELAND.—The Osborn Engineering Co. is preparing plans for a warehouse, 105 x 250 feet, for the Fishel & Marks Co.

CLEVELAND.—The National Screw & Tack Co. has taken out a permit for erection of a factory addition.

CLEVELAND.—The National Carbon Co. has awarded the Hunkin-Conkey Construction Co. the contract for a factory building to be erected at Clarksburg, W. Va.

CLEVELAND.—Bids are being taken for special bridge work to be done on bridges here, by E. G. Krause, clerk of the board of county commissioners.

CLEVELAND.—The board of education has taken out permits for the construction of school building additions to cost about $240,000.

CLEVELAND. — Ernest George, Leader-News building, has plans ready for a brick and steel factory building, 1-story, 80 x 400 feet, for the Eclipse Stove Co., Mansfield, O.

Western and Intermountain Territory

SIOUX CITY, IOWA.—The Midland Packing Co., F. C. Sawyer president, is having plans prepared by Gardner & Lindberg, engineers, for a packing plant including a main building, six stories, 100 x 200 feet, shipping and office building five stories, 70 x 120 feet and a pumping plant.

KANSAS CITY, Mo.—The Black Steel & Wire Co. is enlarging its plant by the erection of an addition.

NORTH KANSAS, MO.—The Illinois Silo & Tractor Co. is contemplating the erection of a 4-story, 118 x 365-foot factory building. The present headquarters of the company are at Bloomington, Ill.

WICHITA FALLS, TEX.—The Wichita Falls Motor Co., builder of motor trucks, has increased its capital stock from $400,000 to $800,000 and will double its plant.

POTEAU, OKLA.—Bonds for $95,000 have been voted for a waterworks system. H. A. Pressey, Oklahoma City, is engineer.

TULSA, OKLA. — Waterworks improvements here to cost $400,000 are being planned.

LINCOLN, NEB.—The Hebb Motors Co. is erecting a new plant, 2-stories, 240 x 420 feet.

OMAHA, Nebr.—The Skinner Packing Co. is preparing plans for the erection of a new packing plant, 6 stories, which will cost about $1,000,000. New machinery and equipment, including water tube boilers, refrigerating machines, steam turbine generating sets, air compressors and other packing house equipment will be installed.

HURON, S. DAK.—The Farmers' Co-operative Packing Co. will build a 4-story packing plant of reinforced concrete construction, plans now being drawn by Henschien & McLaren, 37 West Van Buren street, Chicago.

GLASGOW, MONT.—Farmers of Valley county are planning to build a railroad from here to some point on the Great Northern railroad, to cost about $300,000.

GREAT FALLS, MONT.—Bids are being received by the county commissioners up to July 10, for the construction of a bridge over the Missouri river.

Up and Down the Pacific Coast

NORTHPORT, WASH.—The Electric Point Mining Co. plans the construction of a railroad to connect the lower terminal of its roadway with the Great Northern railroad. The extension will cost $150,000.

SEATTLE.—The Vulcan Mfg. Co., has taken out a permit to construct a $10,000 machine shop.

SEATTLE.—The Seattle Pipe & Galvanizing Co. has taken out a permit for the construction of a $5000 workshop.

SEATTLE.—The Centenial Mill Co. has awarded the contract for constructing the first units of its proposed new plant.

SEATTLE.—City Purchasing Agent W. D. Freeman has been directed by the board of public works to call for bids for 26 street cars.

SEATTLE.—The United States Engineering & Appraisal Co., has completed plans for the shop of the Acme Forge Works, for which bids are now being taken.

TACOMA, WASH. — Materials are being assembled at the car building shops of the Northern Pacific railroad for the construction of 750, freight cars.

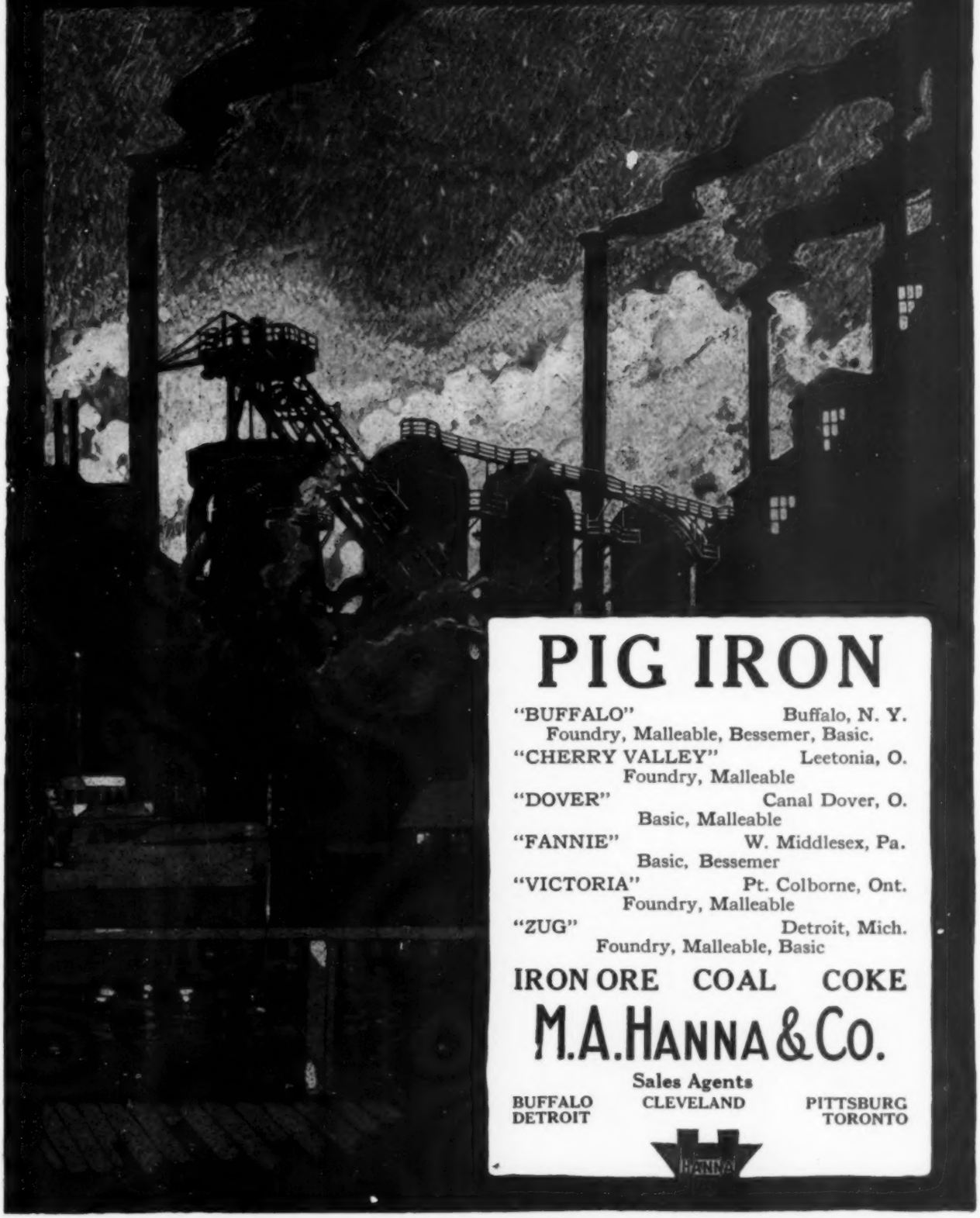
ASTORIA, OREG.—The Portland Bridge & Iron Co. was awarded the contract for the construction of a bridge over the Skipanon river, to cost $5077; and the construction of a bridge over the Nehalenf river to cost $11,000.

NORTH BEND, OREG.—L. J. Simpson recently announced plans have been completed whereby he and Vancouver, Wash., and Portland interests associated with him, will construct a shipyard and sawmill, at a cost of $500,000.

PORTLAND, OREG.—The Globe Grain & Milling Co. is contemplating the construction of a 1500 barrel mill, 5-stories, of reinforced concrete.

LOS ANGELES.—The Motors Equipment & Tractor Co., capitalized at $100,000, has been chartered by J. W. Bate, H. T. Hays and L. G. Dodge.

HANNA



PIG IRON

"BUFFALO" Buffalo, N. Y.
Foundry, Malleable, Bessemer, Basic.

"CHERRY VALLEY" Leetonia, O.
Foundry, Malleable

"DOVER" Canal Dover, O.
Basic, Malleable

"FANNIE" W. Middlesex, Pa.
Basic, Bessemer

"VICTORIA" Pt. Colborne, Ont.
Foundry, Malleable

"ZUG" Detroit, Mich.
Foundry, Malleable, Basic

IRON ORE COAL COKE

M. A. HANNA & Co.

Sales Agents

BUFFALO CLEVELAND PITTSBURG
DETROIT TORONTO

HANNA

Iron and Steel Prices

Corrected to Tuesday Noon

IRON ORE

Superior Ores, Per Ton, Lower Lake Ports	
Old range Bessemer, 55 iron	$5.95
Mesabi Bessemer, 55 iron	5.70
Old range non-Bess., 51½ iron	5.20
Mesabi non-Bess., 51½ iron	5.05

WAREHOUSE PRICES

Steel bars, Chicago	4.17c
Steel bars, Cleveland	4.07c
Steel bars, Detroit	4.13c
Steel bars, Philadelphia	4.13c
Steel bars, New York	4.145c
Steel bars, St. Louis	4.24c
Steel bars, Cincinnati	4.13c
Steel bars, St. Paul	4.395c
Steel bars, Buffalo	**4.05c**
Iron bars, Buffalo	4.715c
Iron bars, Chicago	4.10c
Iron bars, Cleveland	4.67c
Iron bars, Detroit	**4.75c**
Iron bars, St. Louis	4.24c
Iron bars, Cincinnati	4.13c
Iron bars, Philadelphia	4.60c to 4.73c
Iron bars, New York	4.745c
Shapes, Chicago	4.27c
Shapes, Detroit	4.23c
Shapes, St. Louis	4.34c
Shapes, St. Paul	4.495c
Shapes, New York	4.245c
Shapes, Cleveland	4.17c
Shapes, Philadelphia	4.23c
Shapes, Buffalo	4.215c
Shapes, Cincinnati	4.23c
Plates, Buffalo	4.465c
Plates, Chicago	4.52c
Plates, Detroit	4.48c
Plates, St. Louis	4.59c
Plates, St. Paul	4.74c
Plates, New York	4.495c
Plates, Cleveland	4.42c
Plates, Philadelphia	4.48c
Plates, Cincinnati	4.48c
No. 10 blue anl. sheets, Chi.	5.52c
No. 10 blue anl. sheets, Cleve.	5.42c
No. 10 blue anl., Buffalo	5.465c
No. 10 blue anl., sheets, St. L.	5.59c
No. 10 blue anl. sheets, Cinci.	5.48c
No. 10 blue anl. sheets, St. Paul	5.745c
No. 10 blue anl. sh., Detroit	5.48c
No. 28 black sheets, Chgo.	6.52c
No. 28 black sheets, Cleve.	6.42c
No. 28 black sheets, Cinci.	6.48c
No. 28 black, Detroit	6.48c
No. 28 black sheets, St. L.	6.59c
No. 28 black sheets, St. Paul	6.745c
No. 28 galv. sheets, Chgo.	7.77c
No. 28 galv. sheets, Cleve.	7.67c
No. 28 galv. sheets, Cinci.	7.73c
No. 28 galvanized, Detroit	7.73c
No. 28 galv. sheets, St. L.	7.88c
Hoops, Cleveland	4.92c
Hoops, Detroit	4.98c

IRON AND STEEL SCRAP

(Prices in Gross Tons)

STEEL WORKS USE

Bundled sheets, Cincinnati	$22.50 to 23.00
Bundled sheets, Pittsburgh	22.00
Bundled sheets, Cleveland	24.50 to 25.50
Bundled sheets, Buffalo	24.00 to 25.00
Boiler plate, cut, No. 1, Chg.	25.00 to 26.00
Boiler plate, cut No. 1, St. L.	25.50 to 26.00
Frogs, switches, guards, St. L.	28.50 to 29.00
Frogs, switches, guards, Chgo.	29.00
Heavy melting steel, Pitts.	29.00
Heavy melting steel, Buffalo	30.00
Heavy melting steel, Chgo.	29.00
Heavy melt'g steel, Cleveland	29.00
Heavy melting steel, Cinci.	28.00 to 28.50
Heavy melt'g steel, east. Pa.	28.00 to 29.00
Heavy melting steel, N. Y.	26.75
Heavy melting steel, St. L.	28.00 to 28.50
Heavy melt'g steel, Birming.	24.00 to 26.00
Hydraulic press. sheets, Cleve.	28.50 to 29.00
Hydraulic press. sheets, Pitts.	26.00
Hydraulic press. sheets, Chgo.	26.00 to 26.50
Knuckles, couplers, Chgo.	34.00
Knuckles, coup., St. Louis	32.50 to 33.00
Low phos. steel, Buffalo	37.50
Low phos. steel, Pittsburgh	39.00
Low phos. crops eastern Pa.	39.00
Low phos. guaranteed E. Pa.	36.50
Shoveling steel, Chicago	29.00
Shoveling steel, St. Louis	27.00 to 27.50
Springs, Chgo.	34.00
Steel rails, short, Chicago	34.00
Steel rails, short, Cleveland	34.00
Steel rails, short, St. Louis	30.75 to 31.25
Steel rails, old, Birmingham	24.00 to 25.00
Stove plate, Chgo.	25.50 to 26.50
Stove plate, Cincinnati	21.50 to 22.00
Stove plate, St. Louis	22.50 to 23.00
Stove plate, N. J. points	24.75
Stove plate, Birmingham	20.00 to 22.00
Stove plate, Buffalo	24.00 to 25.00
Stove plate, eastern Pa.	24.00 to 25.00
Stove plate, Cleveland	25.00 to 25.50
Stove plate, Pittsburgh	22.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.40
Boston	4.60
Philadelphia	4.10
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.75
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$7.50
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York (r. and w.)	7.50
Philadelphia (r. and w.)	6.60
Pittsburgh	6.10
Savannah, Ga.	3.40
St. Louis	4.25
Chicago to:	
Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.75
Cincinnati	1.75
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70
Duluth, Minn., to:	
Minneapolis, St. Paul	$1.60
Mayville, Wis.:	
Minneapolis-St. Paul	$2.20

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:	
New York	24.5 cents
Philadelphia	23.0 cents
Boston	27.0 cents
Buffalo	21.5 cents
Baltimore	22.5 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	56.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

IRON MILL USE

Angle bars, iron, Chgo.	39.00
Angle bars, steel, St. Louis	30.75 to 31.25
Angle splice bars, St. Louis (iron)	37.50 to 38.00
Arch bars, transoms, Chgo.	45.50 to 46.50
Arch bars and transoms, St. Louis	44.00 to 44.50
Busheling, No. 1, Cleveland	29.00 to 30.00
Busheling, No. 1, Buffalo	29.00 to 30.00
Busheling, No. 2, Buffalo	21.00 to 23.00
Busheling, No. 1, Pittsburgh	32.00
Busheling, No. 1, Cincinnati	25.00 to 25.50
Busheling, No. 1, Chgo.	29.00 to 29.50
Busheling, No. 2, Chgo.	19.50 to 20.50
Busheling, No. 1, St. Louis	28.00 to 28.50
Cast borings, New York	16.50 to 17.50
Cast borings, eastern Pa.	19.00
Cast borings, Buffalo	18.00 to 19.00
Cast, borings, Cleveland	18.25 to 18.50
Cast borings, Cincinnati	17.00 to 17.50
Cast borings, Pittsburgh	**19.00**
Cast borings, Birmingham	12.00 to 12.50
Cast borings, Chgo.	18.50 to 19.00
Cast borings, St. Louis	17.25 to 17.75
City wrought, long, N. Y.	31.50
Cut forge, Chgo.	31.50 to 32.00
Forge flashings, small, Cleve.	**27.00 to 27.50**
Forge flashings, large, Cleve.	27.50 to 28.00
Forge No. 1, eastern Pa.	**26.50 to 27.50**
Grate bars, Buffalo	**24.50 to 25.00**
Grate bars, Cleveland	25.50 to 26.00
Grate bars, N. J. points	24.75
Iron axles, Pittsburgh	**46.50**
Iron axles, Cincinnati	43.50 to 44.00
Iron axles, Cleveland	**46.50**
Iron axles, Chicago	**46.50**
Iron axles, eastern Pa.	**46.50**
Iron axles, St. Louis	**46.00 to 46.50**
Iron axles, Buffalo	**45.00 to 47.00**
Iron rails, Chicago	39.00
Iron rails, Buffalo	**36.00 to 37.00**
Iron rails, Cincinnati	34.00 to 35.00
Iron rails, St. Louis	37.00 to 37.50
Iron rails, Cleveland	**34.00**
Machine turnings, Cincinnati	17.00 to 17.50
Machine turnings, Cleve.	18.00 to 18.25
Machine turnings, Buffalo	**17.00 to 17.50**
Machine turnings, N. Y.	16.00 to 16.50
Machine turnings, Pitts.	18.00 to 19.00
Machine turnings, east. Pa.	19.00
Machine turnings, Birming.	16.50 to 17.00
Machine turnings, Chicago	17.75 to 18.25
Machine shop turnings, St. L.	17.50 to 18.00
Pipes and flues, Cleveland	27.00 to 28.00
Pipes and flues, Chicago	27.50 to 28.00
Pipes and flues, St. Louis	26.25 to 26.75
R. R. mch. cast, No. 1, Buff.	34.00
R. R. wrgt. No. 1, Buffalo.	34.00
R. R. wrgt., No. 1, east Pa.	34.00
Railroad wrgt. No. 1 Cinci.	33.50 to 34.00
Railroad wrgt., No. 1, Cleve.	34.00
R. R. wrought, No. 1, Pitts.	34.00
Railroad wrgt., No. 2, Chgo.	31.50 to 32.00
Railroad wr'ght, No. 1, Chgo.	33.50 to 34.00
R. R. wrgt. No. 1, Birming.	24.00 to 25.50
No. 1 yard wrought East Pa.	**33.00**
No. 1 busheling wrgt., E. Pa.	**31.00**
Sheet wrought, Pittsburgh	34.00
Railroad wrgt., No. 1, St. L.	32.00 to 32.50
Railroad wrought, No. 2	31.00 to 31.50
Wrought pipe, Buffalo	27.00 to 28.00
Wrought pipe, eastern Pa.	33.00
Wrought pipe, ungraded, eastern Pa.	29.00

IRON OR STEEL WORKS USE

Axle turnings, Cleveland	$24.00
Axle turnings, Buffalo	24.00
Heavy axle turn'gs, E. Pa.	24.00
Heavy axle turnings, Pitts.	24.00
Shafting, New York	35.50
Shafting, eastern Pa.	39.00
Steel car axles, Pittsburgh	46.50
Steel car axles, Birmingham	**30.00 to 32.00**
Steel car axles, New York	**43.00**
Steel car axles, Buffalo	**44.00 to 46.00**
Steel car axles, Cleveland	**44.00**
Steel car axles, eastern Pa.	**46.50**
Steel car axles, Chgo.	**46.50**
Shafting, St. Louis	37.50 to 38.00
Steel car axles, St. Louis	**46.00 to 46.50**

IRON FOUNDRY USE

Car wheels, (iron), Pitts.	**$29.00**
Car wheels, (steel), Pitts.	**34.00 to 35.00**
Car wheels, eastern Pa.	**29.00**
Car wheels, Buffalo	**29.00**
Car wheels, Chicago	**29.00**
Car wheels, St. Louis	**28.50 to 29.00**
Car wheels, Birmingham	25.00 to 26.00
Car wheels, Cleveland	**30.00**
Tram car wheels, Birming.	21.00 to 23.50
Cast, No. 1, Birmingham	24.00 to 26.00
Cast, No. 1, cupola east. Pa.	34.00
Cast No. 1, Cleveland	31.50 to 32.00
Cast, No. 1, Cincinnati	32.00 to 32.50
Cast, 1, heavy, N. J. points	**32.25 to 32.75**
Cast, 1, machy., N. J. points	**32.50 to 32.75**
Cast, No. 1, Chicago	31.50 to 32.00
Cast, No. 1, Pittsburgh	**32.50 to 33.00**
Cast, No. 1, St. Louis	27.50 to 28.00
Malleable, Cincinnati	**30.00 to 34.00**
Malleable, Cleveland	**30.00 to 34.00**
Malleable, Buffalo	**29.00 to 34.00**
Malleable, Pittsburgh	**33.00 to 34.00**
Malleable, east. Pa.	**29.00**
Malleable, cupola, East Pa.	33.00
Malleable railroad, Chgo.	33.00 to 34.00
Malleable, agricultural, Chgo.	32.00 to 32.50
Malleable railroad, St. Louis	29.50 to 30.00
Malleable agricultural, St. L.	28.50 to 29.00

MISCELLANEOUS USES

Boiler punchings Chgo.	36.00 to 36.50
Reroll. rails, 5 ft. & ov., Pitts.	**34.00**
Reroll. rails, 5 ft. & ov., Chgo.	**34.00**
Reroll. rails, 5 ft. & ov., E. Pa.	**34.00**
Reroll. rails, 5 ft. & ov., St. L.	**33.50 to 34.00**
Reroll. rails, 5 ft. or over, Cleve.	**34.00**
Rerolling rails, long, Birm.	**37.50 to 38.50**
Locomotive tires, Chgo.	45.50 to 46.50
Locomotive tires, St. Louis	41.50 to 42.00